The RUBBER AGE

March, 1944


# RIO RESIN

•

Among the criticisms of GR-S products after aging or over curing are,

**Too Much Loss in Elongation**

*and*

**Too Much Increase in Hardness**

These defects are accompanied by poor flexing and bad cracking and tearing properties.

All of these characteristics are today being satisfactorily improved, in some GR-S goods, by the proper use of RIO RESIN.

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**R. T. VANDERBILT CO., INC.**

230 Park Avenue, New York City

Newsletter No. 3
MARCH, 1944

Published by Rubber Chemicals Division of DU PONT

# Heliozone Retards Sun Checking of GR-S Vulcanizates

**GR-S** VULCANIZATES which are to be used out-of-doors should be protected by the inclusion of a sun-checking inhibitor in the compound. When such a protective ingredient is not included, the stocks will crack readily when exposed to either direct or reflected sunlight.

**DYNAMIC SERVICE** — The sun checking of vulcanizates in static service, however, is not as serious as the failure resulting when such stocks are subsequently flexed or deformed. Serious failure due to flexing occurs in GR-S vulcanizates only after the surface has been injured. Surface cracking due to sun checking is a major disadvantage since the surface-cracks grow rapidly in dynamic service.

Although it is impossible to guard against all of the hazards that cause cuts or cracks in products such as belts, footwear, coated fabrics and tires, it is entirely possible to protect GR-S from sun checking by the addition of small quantities of Heliozone to the GR-S compound.

**HELIOZONE EFFECTIVE**—Heliozone has been of considerable advantage in improving the sun-checking resistance of natural rubber. It has even greater possibilities in GR-S stocks where all possible measures must be taken to retard the formation of small cracks or checks.

Heliozone is made from a specially selected group of waxy materials and has a specific gravity of 0.90 and a melting point of about 67° C. Because it melts at mixing temperatures, it disperses easily in the stock. Heliozone functions by blooming to the surface after cure, forming a smooth, continuous, transparent, colorless, plastic film which can be scraped off only with difficulty. The film retains its flexibility at temperatures as low as 0° F., and does not melt and disappear into the GR-S at hot summer temperatures.

## Colors for GR-S and Neoprene

**DU PONT RUBBER COLORS,** like many other materials, have been hit by war, and their use in products for civilian needs during the past two years has been sharply curtailed by Government regulations. There is a growing tendency toward the increased use of colors now that some of the restrictions are being eased. Looking into the future, further heavy demands for colors may be anticipated to meet the varied tastes and fancies of the consuming public once the clouds of war are dispersed and the world is again bright.

The bombing of Pearl Harbor interrupted our program of introducing a de luxe line of rubber colors. This program was intended to supply the industry with a selected few high-quality colors in both dry powder and dispersed form. For obvious reasons, production of rubber dispersed colors was discontinued but will be resumed as soon as conditions permit. Limited quantities of several rubber dispersed colors are still available and these may be used as desired.

Development work on dry powder colors has not abated and a full line of de luxe colors is now available. The following all-purpose colors are recommended:

**Colors for Dry Rubber, Neoprene and Other Synthetic Elastomers**

Rubber Red WRT
Rubber Red 2B
Rubber Orange F
Rubber Yellow G
Rubber Monastral Fast Green GS
Rubber Monastral Fast Blue CP
Rubber Blue YDE

**Colors for Neoprene or Rubber Latex**

Rubber Red WRT
Rubber Red 2B
Rubber Orange OT
Rubber Yellow HN
Rubber Monastral Fast Green GS
Rubber Monastral Fast Blue CP
Rubber Blue YDE
Rubber Blue N

These colors were selected with regard to their cleanness of shade, stability to varying curing conditions, fastness to light, freedom from bleeding and migration, ease of dispersion, and other properties that are desirable in dry rubber and latex compounds. When properly blended, they provide the compounder with almost any hue, shade or tint in the visible spectrum. The cost of these colors based on tinctorial power is in many cases lower than that of cheaper colors having less desirable properties.

Du Pont rubber colors may be used with equally satisfactory results in rubber, neoprene or GR-S. The latter two elastomers, however, contain chemical stabilizers which cause their vulcanizates to darken slightly on exposure to light. For this reason, the shade of finished colored articles made from these two elastomers will change regardless of the light-fastness of the color used. The use of white pigments in the compound is recommended to minimize the discoloration caused by exposure to light and to enhance the brightness of the finished article. Where a minimum of discoloration is essential, we suggest the use of Neoprene Type GN (GR-M) and GR-S-ST, both of which contain non-discoloring stabilizers.

Our experience with Du Pont colors in other types of synthetic elastomers has been limited, but we anticipate that equally satisfactory results can be obtained.

**METAL DRUMS**—We still need a faster return of metal drums in which neoprene latex is shipped if we are to have enough for current shipments. We cannot buy new drums unless we can prove a high return of used drums. Please help us by returning latex drums from all points east of the Mississippi River. We pay return transportation from these points and the ceiling price.

***BACK THE ATTACK***
***WITH WAR BONDS***

DU PONT

RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . *Through Chemistry*

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TECHNOLOGY DEPT:

# HYCAR OR-25

## *now colored blue for easy identification*

PUBLIC LIBRARY
MAR 3 1944
DETROIT

TO assist customers in readily identifying Hycar OR-25, after it has been removed from the shipping carton, this product will be made with a pale but distinctive blue color.

This coloring of Hycar OR-25 is accomplished by adding a very small amount of methylene blue to the latex prior to coagulation and washing. The methylene blue content in the dried rubber is less than five thousandths of one percent.

Exhaustive tests on both conventional black and light colored stocks have proved that the addition of methylene blue has absolutely no effect on the excellent low temperature flexibility, oil and heat resistance and other physical properties of OR-25 compounds. In the case of light stocks, blue-tinted OR-25 actually produces cleaner, brighter white and pastel shades.

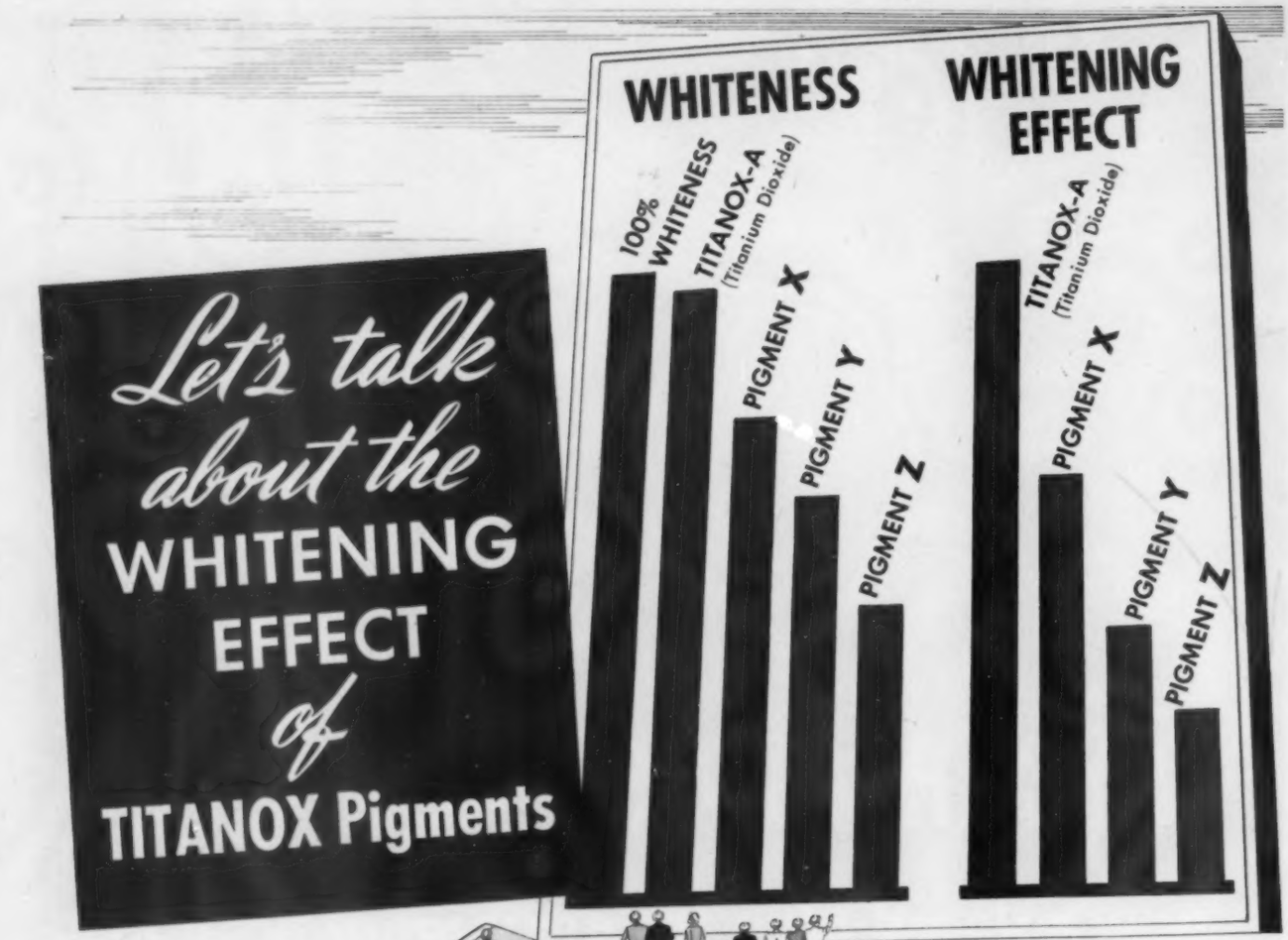
So, when you see Hycar OR-25 in the new blue tint, you will know that this innovation is a service to you to prevent any confusion in the identity of our products. *Hycar Chemical Company, 335 South Main Street, Akron 8, Ohio.*

**Hycar**

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

*Synthetic Rubber*

# *Let's talk about the* WHITENING EFFECT *of* TITANOX Pigments




SCIENCE has not yet provided a pigment of perfect whiteness. The nearest approach in a dry color is titanium which has been prepared for commercial use in the form of titanium dioxide. Its variation from perfect brightness is only a small fraction of one per cent.

TITANOX-A is pure titanium dioxide and therefore represents the maximum whiteness obtainable in pigments. Along with this exceptional whiteness, TITANOX-A has a tinting strength never equaled before the development of titanium pigments.

**Where minimum pigmentation is desired, TITANOX-A may be trusted to give the greatest whitening effect to all types of rubber. Precipitated on a calcium base, as in TITANOX-C, it gives exceptional whitening effect at lower volume cost where higher pigmentation is possible.**

***Send your white pigment problems to our Rubber Service Department. Cooperation is assured.***

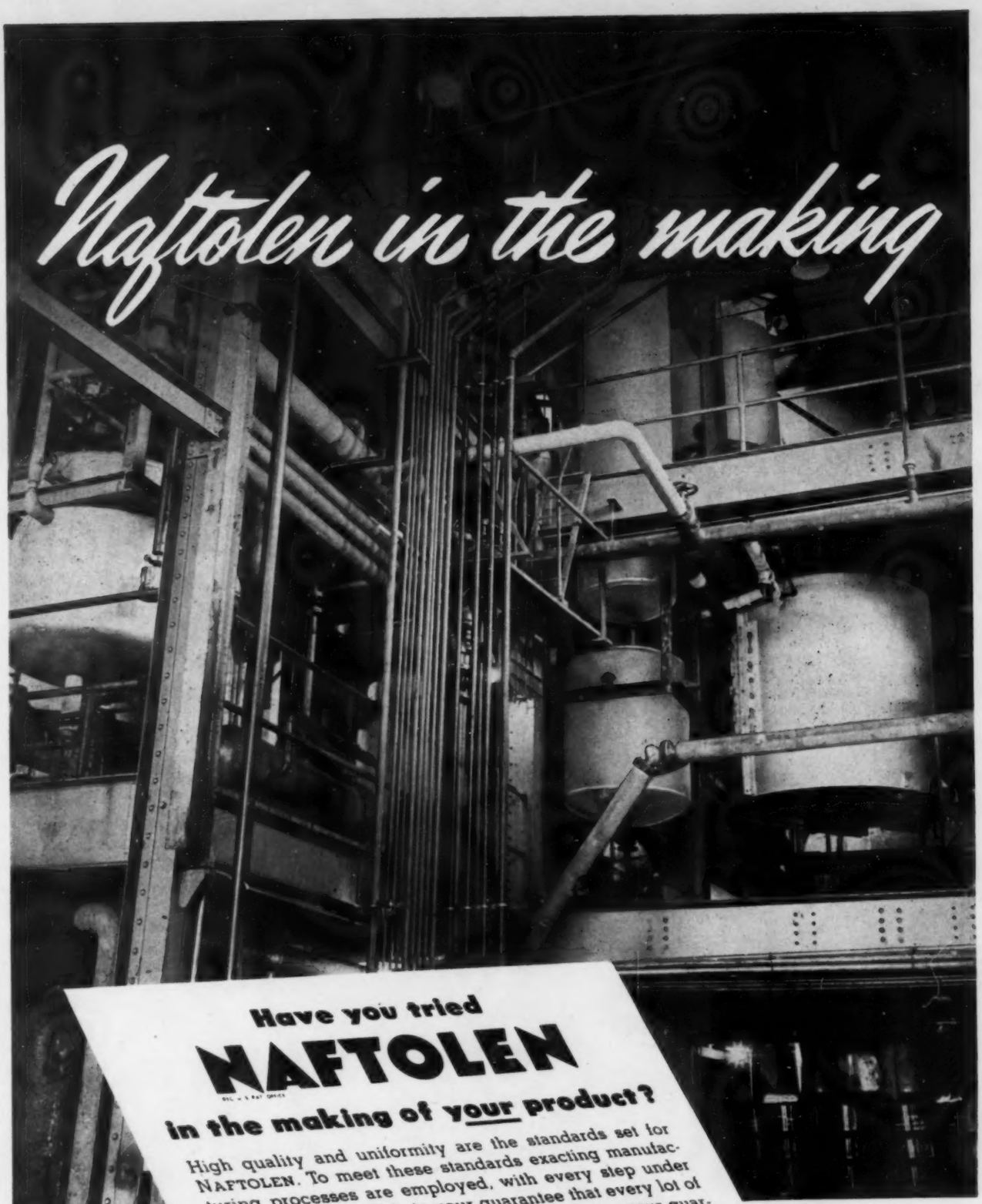
**TITANIUM PIGMENT CORPORATION**, *Sole Sales Agent* • 111 B'way, New York 6, N. Y. • 104 South Michigan Ave., Chicago 3, Ill. • 350 Townsend St., San Francisco 7, Calif. • 2472 Enterprise St., Los Angeles 21, Calif.

TITANOX

REG. U.S. PAT. OFF.

# TITANOX

TRADE MARK




**Have you tried**

# NAFTOLEN

**in the making of your product?**

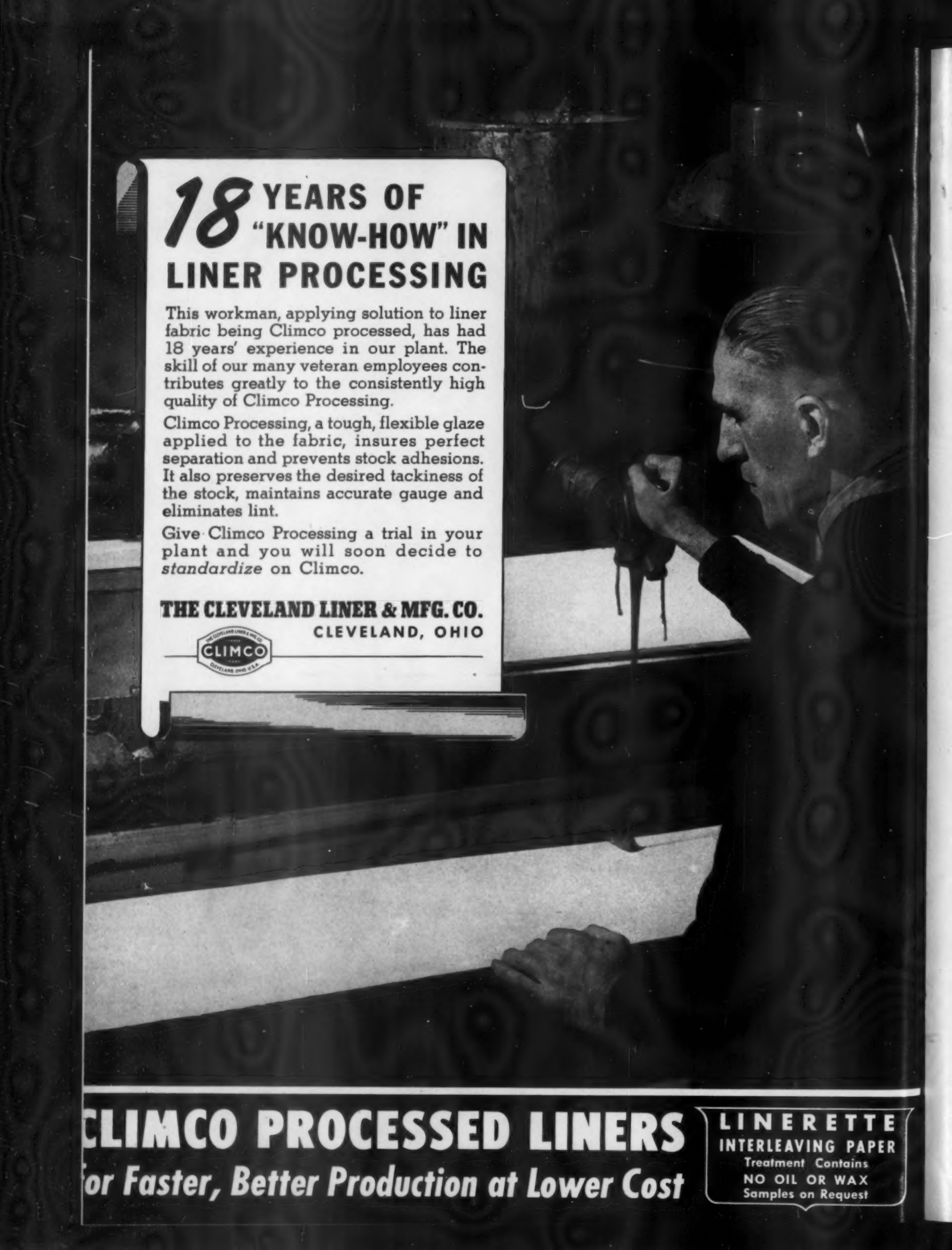
High quality and uniformity are the standards set for NAFTOLEN. To meet these standards exacting manufacturing processes are employed, with every step under constant control. This is your guarantee that every lot of NAFTOLEN will be of the same high quality – your guarantee of uniformity in the making of your product.

**Insure the quality of your GR-S products with NAFTOLEN.**

**WILMINGTON CHEMICAL CORPORATION**

**10 East 40th Street · New York 16, N. Y.**

**Plant and Laboratory: Wilmington, Delaware**


18 YEARS OF "KNOW-HOW" IN LINER PROCESSING
This workman, applying solution to liner fabric being Climco processed, has had 18 years' experience in our plant. The skill of our many veteran employees contributes greatly to the consistently high quality of Climco Processing.
Climco Processing, a tough, flexible glaze applied to the fabric, insures perfect separation and prevents stock adhesions. It also preserves the desired tackiness of the stock, maintains accurate gauge and eliminates lint.
Give Climco Processing a trial in your plant and you will soon decide to *standardize* on Climco.
THE CLEVELAND LINER & MFG. CO.
CLEVELAND, OHIO
CLIMCO
CLIMCO PROCESSED LINERS
for Faster, Better Production at Lower Cost
LINERETTE
INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

# when product-performance is a Toss-Up . . .

Behavior of your products in service is best determined by the facts established in the laboratory . . . By exhaustive tests on materials that make up the compounds . . . Tests that PROVE and point the way to results more dependable than those decided by the flip of a coin.

RESINEX has the laboratory test facts behind it. These facts show higher tensile strength, elongation, greater resistance to abrasion and flex cracking.

RESINEX is a definite aid where cut growth is a factor.

RESINEX is a resinous thermoplastic extender-plasticizer compatible with all Synthetic, Reclaimed and Natural Rubbers. Its applications are multiple—Tires, Tank Track, Tubes, Camelback, Soles, Heels, Hose and a variety of other products.

RESINEX is available now in ample quantities for vast production. Its low cost is of great importance, too.

You should have all the facts about this material for your products—planning, development and testing. We will send them to you with a sample of RESINEX for laboratory test if you will write or wire us.

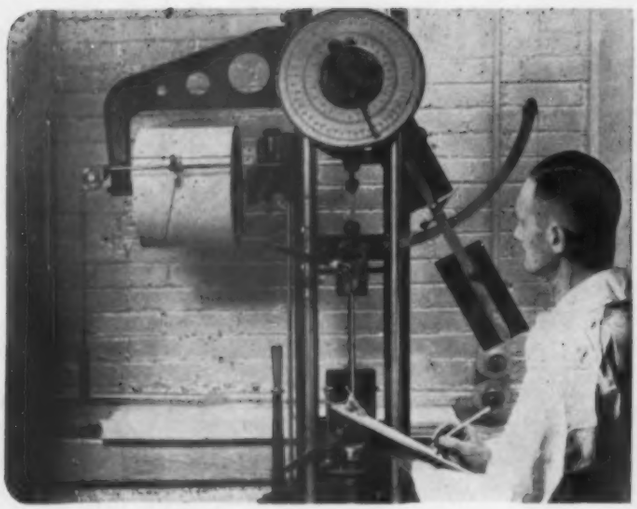
# RESINEX

***Precision Chemicals for the Rubber Industry***

**STANDARD** *Chemical Company*

General Offices: AKRON 8, OHIO

# Where tire and hose wire get the third degree



THE time to catch trouble is before it starts. At least that's what we believe at National-Standard, and that's why we place so much importance upon one particular room in our plant.

That room is our testing and inspection laboratory and through it passes every single reel of National-Standard wire. Our procedure is to cut a piece of wire from *both ends* of each reel and subject it to our own rigid tests for tension, torsion and elongation. In all cases, our tests exceed customers' specifications and every reel must meet those tests or it does not leave our plant.

We've built our reputation for quality wire by paying more-than-usual attention to testing and inspection. It is one of the big reasons why people in the rubber tire and hose industries look to National-Standard as the kind of place where they get the very best that modern and efficient equipment, experience and engineering skill can produce in bead wire, braids and tapes.

★ ★ NATIONAL STANDARD Company ★ ★

*Divisions of National-Standard Company*

**NATIONAL-STANDARD**
*Niles, Mich.*
TIRE WIRE, FABRICATED BRAIDS AND TAPE

**WAGNER LITHO MACHINERY**
*Hoboken, N. J.*
LITHOGRAPHING AND SPECIAL MACHINERY

**ATHENIA STEEL**
*Clifton, N. J.*
COLD ROLLED, HIGH-CARBON SPRING STEEL

**WORCESTER WIRE WORKS**
*Worcester, Mass.*
ROUND STEEL WIRE, SMALL SIZES

# A NEW SELF-ACTIVATING ACCELERATOR FOR GR-S

## AERO AC 165*

WELL-ROUNDED SERVICE TO THE RUBBER INDUSTRY

★

AERO AC 50*

AERO BRAND DOTG

AERO BRAND DTG

AERO BRAND ACRYLONITRILE

AERO BRAND RUBBER SUSPENSION

K & W MAGNESIUM OXIDE

K & W MAGNESIUM CARBONATE

CALCIUM STEARATE

AMERICAN CYANAMID

& CHEMICAL CORPORATION

(A Unit of American Cyanamid Company)

30 ROCKEFELLER PLAZA · NEW YORK 20, N. Y.

A new *Thiokol** SYNTHETIC RUBBER

# TYPE ST

TO the familiar solvent resistance characteristic of all types of Thiokol synthetic rubber, Type ST adds a *new* and outstanding advantage —greatly increased resistance to cold flow.

A second important characteristic of Thiokol ST is its excellent flexibility at low temperatures —a property obtained without the addition of liquid plasticizers. This feature is of particular interest in aircraft applications, where liquid plasticizers may be extracted by aviation fuels and hydraulic brake fluids.

Easier processing and improved odor characteristics are other advantages of the new material.

Write for full information on Thiokol ST.

*THIOKOL CORPORATION, Trenton, N. J.*

*Manufacturers of THIOKOL* SYNTHETIC RUBBER and RUBBER CHEMICALS*

* Thiokol Corporation Trademark Reg. U. S. Pat. Off.

# *Our Trademark now becomes our Company Name*

295 MADISON AVENUE

NEW YORK

WE WISH TO ANNOUNCE THAT OUR FIRM NAME OF

WISHNICK-TUMPEER, INC.

HAS BEEN CHANGED TO

WITCO CHEMICAL COMPANY

THIS CHANGE DOES NOT AFFECT THE CORPORATE STRUCTURE,

MANAGEMENT, PERSONNEL, OR POLICIES OF OUR COMPANY

**WITCO CHEMICAL COMPANY** MANUFACTURERS AND EXPORTERS

[FORMERLY WISHNICK-TUMPEER, INC.]

295 MADISON AVENUE, NEW YORK 17, N. Y.

*Boston • Chicago • Cleveland • Akron • Detroit • London*

The complete line of

# Continental

## CARBON BLACKS

will hereafter be distributed solely through

**WITCO CHEMICAL COMPANY**
[FORMERLY WISHNICK-TUMPEER, INC.]

The addition of the Continental grades to the well-known line of WITCO Carbon Blacks, centers in one broad organization a quality carbon black service prepared to meet all requirements of the rubber industry.

## WITCO CHEMICAL COMPANY

[FORMERLY WISHNICK-TUMPEER, INC.]

MANUFACTURERS AND EXPORTERS

295 MADISON AVENUE, NEW YORK 17, N. Y.

Boston · Chicago · Cleveland · Akron · Detroit · London

**JACK SIDER**
*President*

**J. K. McELLIGOTT**
*Executive Vice-President*

***"Jack" and "Mac" are here to serve you***

# THE LOEWENTHAL COMPANY

***Since 1868***

★

For over 75 years this company, as a pioneer, has specialized in the purchase, sorting, and distribution of scrap and places at the disposal of the trade its long experience, established facilities, and trained staff in handling all-important scrap rubber.

## *Exclusively*

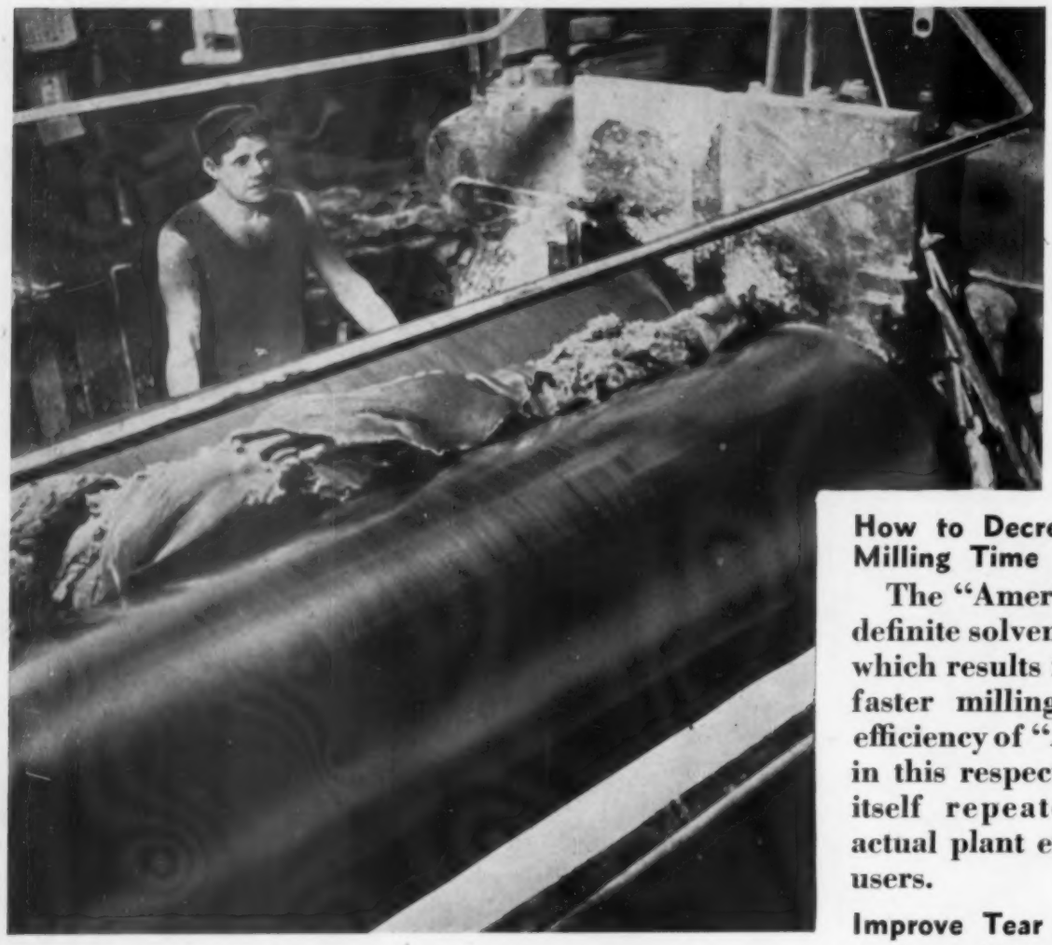
# SCRAP RUBBER

★

**CHICAGO 1 — 188 West Randolph St.**
**AKRON 5 — 159 Clewell Street**

**CABLE ADDRESS: "GYBLOWELL" . . . . Chicago, Ill. and Akron, Ohio**

# *SPEED UP MILLING—*



**How to Decrease Milling Time**

**The "Amerigums" have definite solvency for GR-S, which results in better and faster milling. The high efficiency of "Amerigums" in this respect has proved itself repeatedly in the actual plant experience of users.**

**Improve Tear Resistance**

**"Amerigums" show tear up to 400 in a standard GR-S formulation which, using conventional plasticizing extenders, shows tears of only 150 to 250.**

**Increase Tensile Strength**

**Tensile strength — "Amerigums" impart uniformly high tensile strength to GR-S without increasing the modulus or decreasing elongation.**

## AMERIGUM
*SYNTHETIC RESINOUS*
## PLASTICIZERS & EXTENDERS

*for GR-S and other SYNTHETIC RUBBERS*

---

**AMERICAN ALKYD INDUSTRIES INC.,**
CARLSTADT, NEW JERSEY

# UNION CARBIDE REPORTS
## *first full-year's production of*
# BUTADIENE
## for the Government's Synthetic Rubber Program
### (*INSTITUTE, W. VA. PLANT*)

*Night view of the immense butadiene plant at Institute, W. Va.*

**A LITTLE OVER A YEAR AGO*** the first tank car of butadiene was shipped from the Government's large integrated rubber project at Institute, W. Va. This historic shipment came from the immense butadiene plant which was designed and built by CARBIDE AND CARBON CHEMICALS CORPORATION for the Government's Defense Plant Corporation—and is being operated by this Unit of UCC, for the Rubber Reserve Company.

**FIRST YEAR'S PRODUCTION OVER THE RATED CAPACITY**—that is the record of this huge 80,000-ton-per-year plant during its first twelve months! This has been accomplished in spite of the many inherent problems that had to be solved in starting a wholly new project of this magnitude.

Over 8/10 of a short ton of butadiene is required to make about one long ton of Buna S type synthetic rubber. Butadiene from this plant during the past year has provided more than 90,000 long tons of synthetic rubber for the Nation's requirements, both military and essential civilian. The delivery of this all-important ingredient also has made possible early production of synthetic rubber under the Government's program.

*The first tank carload of butadiene from Institute was shipped on February 18, 1943—less than one month after Unit No. 1 of the four large butadiene-producing units had started operating. Subsequently, Unit No. 2 started producing in March, Unit No. 3 in April, and Unit No. 4 on May 25, 1943.

**NOW HUGE BUTADIENE PRODUCER**—although originally designed to produce 80,000 tons annual capacity, the Institute plant is now delivering butadiene at a rate of more than 100,000 tons per year. An identical plant using Carbide's process was put into operation by the Koppers United Company in September, 1943, at Kobuta, near Pittsburgh, Pa.

**OVER 75% OF THE TOTAL PRODUCTION OF BUTADIENE** for the Government's synthetic rubber program in 1943 came from the alcohol process developed by CARBIDE AND CARBON CHEMICALS CORPORATION.

In addition to the plant at Institute, Carbide made available plans for the large plant at Kobuta, which was built and is being operated for the Government by Koppers United Company.

CARBIDE AND CARBON CHEMICALS CORPORATION also has designed and built for the Defense Plant Corporation, and is operating for the Rubber Reserve Company, another large butadiene plant at Louisville, Ky.

▼

*Business men, technicians, teachers, and others are invited to send for the book TX-2 "Butadiene and Styrene for Buna S Synthetic Rubber from Grain Alcohol," which explains what these plants do, and what their place is in the Government's rubber program.*

***BUY WAR BONDS AND STAMPS***

## UNION CARBIDE AND CARBON CORPORATION

**30 East 42nd Street** UCC **New York 17, N. Y.**

***Principal Units in the United States and their Products***

**ALLOYS AND METALS**
Electro Metallurgical Company
Haynes Stellite Company
United States Vanadium Corporation

**CHEMICALS**
Carbide and Carbon Chemicals Corporation

**ELECTRODES, CARBONS AND BATTERIES**
National Carbon Company, Inc.

**INDUSTRIAL GASES AND CARBIDE**
The Linde Air Products Company
The Oxweld Railroad Service Company
The Prest-O-Lite Company, Inc.

**PLASTICS**
Bakelite Corporation
Plastics Division of Carbide and Carbon Chemicals Corporation

*The material herein has been reviewed and passed by the Office of Rubber Director, the Rubber Reserve Company, the Defense Plant Corporation, and the War Department.*

# has this "thief" left his mark in your mixing room

We need spare Banbury parts. . . If you have any extra parts you will be helping someone else by letting us buy them. They are urgently needed.

SPECIALIZED skill establishes the expert's ability to identify the finger print . . . Specialized skill, too, establishes the expert "know how" at Interstate for redesigning and rebuilding Banburys to process synthetic rubbers more effectively and more efficiently . . . The "thumbprints" of lost production may be showing on your mixing records with increasing frequency. We can identify their causes—and make the needed corrections in Banbury design to speed up processing operations . . . The cost of stopping a "thief" of production by Interstate's expert service is a small portion of what the cost of a mounting loss could be through continued inefficiency. Write, wire or phone us about your Banbury problems.

SERVING THE RUBBER INDUSTRY

IWS

INTERSTATE WELDING SERVICE

Main Plant: 914 Miami Street . . . AKRON 11, OHIO . . . Phone: JE 7970

*EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING*

*Increased Efficiency Through Increased Fineness*

MICRONIZED MICRONIZED MICRONIZED MICRONIZED MICRONIZED MICRONIZED MICRONIZED MICRONIZED*

# FINELY-GROUND SULFUR

*Is the answer to the problem of SULFUR DISPERSION in GR-S and other Synthetic Rubbers*

## MICRONIZED CT

25 parts of an especially developed mechanical dispersing agent, of neutral effect in rubber, is added to 75 parts of sulfur and "micronized" to an average particle size of 3 microns. The extreme fineness, perfect blend and unique dispersing agent largely eliminates the danger of poor processing control in the plant.

## MICRONIZED SC

A 95% sulfur product "micronized" to an average particle size of 3 microns—meets many compounding requirements.

*Samples Furnished On Request*

★

## MICRONIZER PROCESSING CO., Inc.

### MOORESTOWN, NEW JERSEY, U. S. A.

* Reg. U. S. Pat. Off.

# NEED ANY HELP?

**NINE TIMES OUT OF TEN,** the technician who has been trained to work with natural rubber finds no difficulties in working with the synthetic material. But – because this material is *new,* and because it is in some ways different from natural rubber – he may be unable to resolve any difficulty quickly enough to keep war production going ahead without stoppage.

You may never run into this problem, but if you do, remember, we can help you. Perbunan synthetic rubber was developed in the Esso Laboratories of the Standard Oil Development Company; our scientists are as familiar with it as your own scientists are with natural rubber. Our organization makes Perbunan all the way from raw petroleum to finished rubber.

All the knowledge we have gained, plus the experience of our field technicians, is yours to employ in solving your own problems. Feel free to call upon us whenever you need help.

***THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME***

PERBUNAN
REG. U. S. PAT. OFF.

Write STANCO DISTRIBUTORS, INC.
26 Broadway, New York 4, New York.
*Warehouse stocks in New Jersey, Louisiana and California.*

# BAKER PLASTICIZERS

*are designed especially for the following resins:*

Vinyl Resins
- Polyvinyl Butyral
- Polyvinyl Alcohol
- Polyvinyl Acetate
- Polyvinyl Chloride
- Vinyl Acetate-Vinyl Chloride Copolymers

Phenolic Resins

Alkyd Resins

Cellulose Resins
- Cellulose Nitrate
- Ethyl Cellulose
- Cellulose Acetate

Acrylic Resins
- Methyl-methacrylate

Urea Formaldehyde Resins

Melamine Resins

**The**

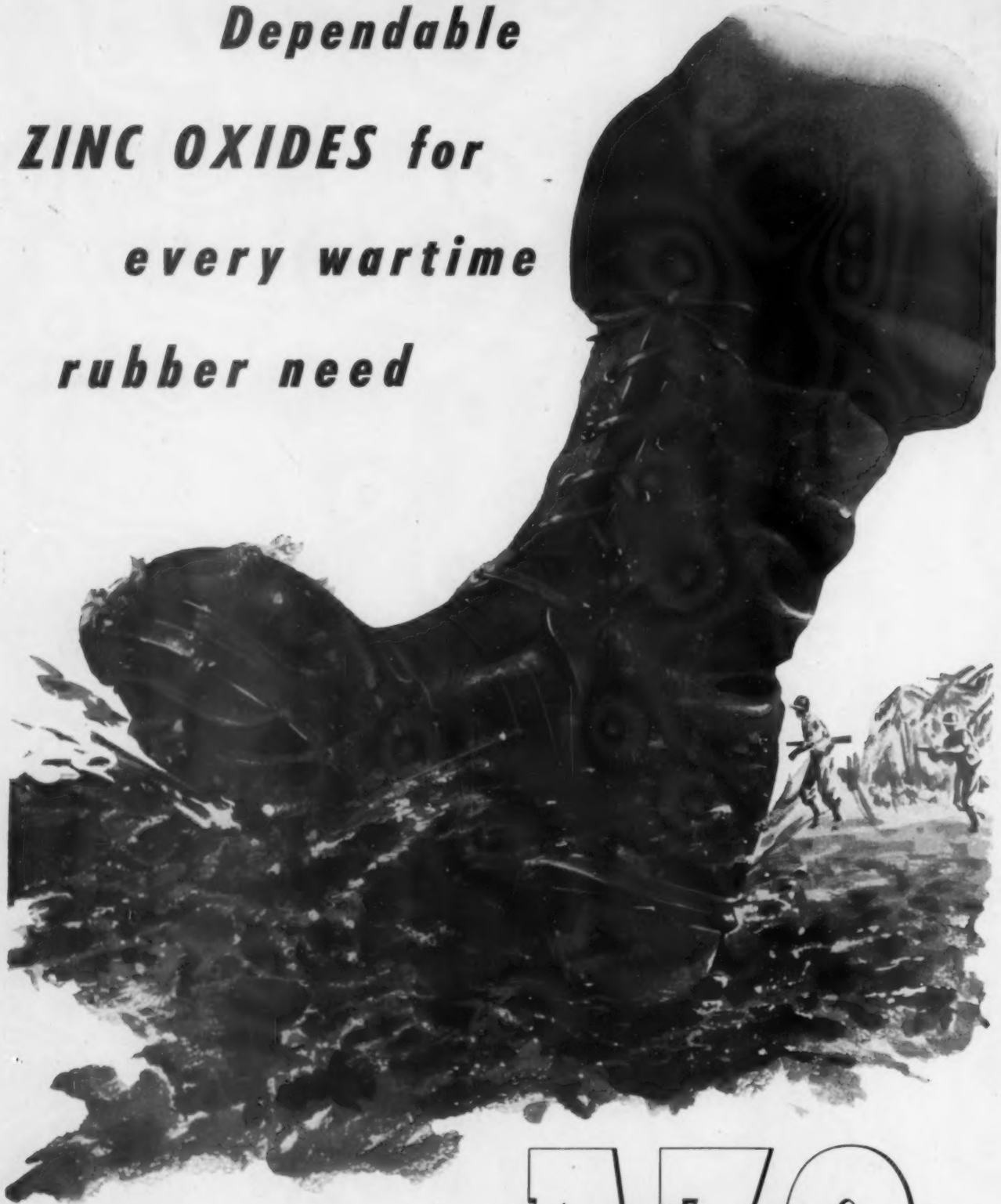
## BAKER CASTOR OIL COMPANY

*Established 1857*

120 Broadway, New York 5, New York

Jersey City, New Jersey — Los Angeles, California — Bayonne, New Jersey

# *Dependable ZINC OXIDES for every wartime rubber need*



**AZO**

**ZINC OXIDES**

**AMERICAN ZINC SALES CO., Distributors for AMERICAN ZINC, LEAD & SMELTING CO.**

COLUMBUS, OHIO - CHICAGO - ST. LOUIS - NEW YORK

# BUNATAK-U

REG. U.S. PAT. OFFICE

## The *QUALITY* PLASTICIZER for Synthetic Rubbers

●

IN successful use today by leading rubber manufacturers using **GR-S** in the production of such items as:

**FOOTWEAR—Outsoles, Uppers, etc.**
**PROOFED GOODS—Calendered, Spread.**
**THREAD—Rubber Covered.**
**MOLDED GOODS—Of Many Types.**

●

BUNATAK-U is particularly effective in

**NEOPRENE** COMPOUNDING

where it gives flexibility yet does not affect the hardness of the vulcanized product.

●

*BUNATAK-U has excellent dispersing qualities and helps produce stocks with high physical properties including high abrasion resistance.*

WRITE TODAY FOR SAMPLES AND INFORMATION

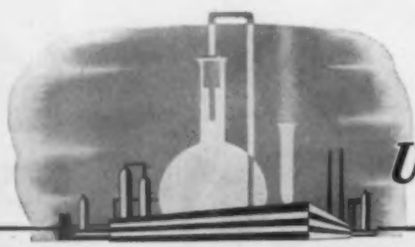
## BUNATAK CHEMICAL COMPANY

**227 Pleasant St., MALDEN, MASS.**

# UBATEX replaces LATEX...

## for BACKING, COMBINING, COATING

UBATEX is a completely synthesized latex (not a dispersed resin compound) that appears and handles similar to unvulcanized latex, dries to a tough, flexible film practically identical to a latex film, does not stain, is non-inflammable, and provides ageing and waterproof qualities definitely superior to latex — *the Ubatex film reaches maximum strength at room temperature, making vulcanization unnecessary.* Write today for free sample — describing materials and application methods involved.



**UNION-BAY STATE Company**

50 HARVARD STREET, CAMBRIDGE 42, MASS.

# GET THIS DESIGN ON COATED FABRICS WITHOUT

# Embossing!

## IT'S SIMPLE WITH

# WRINKLE

With WRINKLE you simply coat the base on a spreader or by spraying . . . put it through the drying chamber . . . and a texture equal in attractiveness to a costly embossing operation will result. Let us prove this point to you. Send a sample of your material for processing in our laboratory.

*Billy Wrinkle Says*

"Your name should be on our mailing list to receive NEW WRINKLES IN FINISHING regularly. It is the only way to keep up with modern, scientific and revolutionary developments in product finishing and coating technique."

## NEW WRINKLE INC.

314 W. FIRST ST. · DAYTON 2, OHIO

THE making of fabrics for the rubber industry and the making of rubber products themselves have this in common. They must start with quality, and quality must prevail all the way through. So it is with MT. VERNON Fabrics. They start with carefully selected top grades of cotton. Their yarns are spun to rigid standards of tolerance. They are woven with that high degree of uniformity which assures for every rubber product in which they are used, quality all the way through.

MT. VERNON WOODBERRY MILLS, INC.

**TURNER HALSEY COMPANY**

*Selling Agents*

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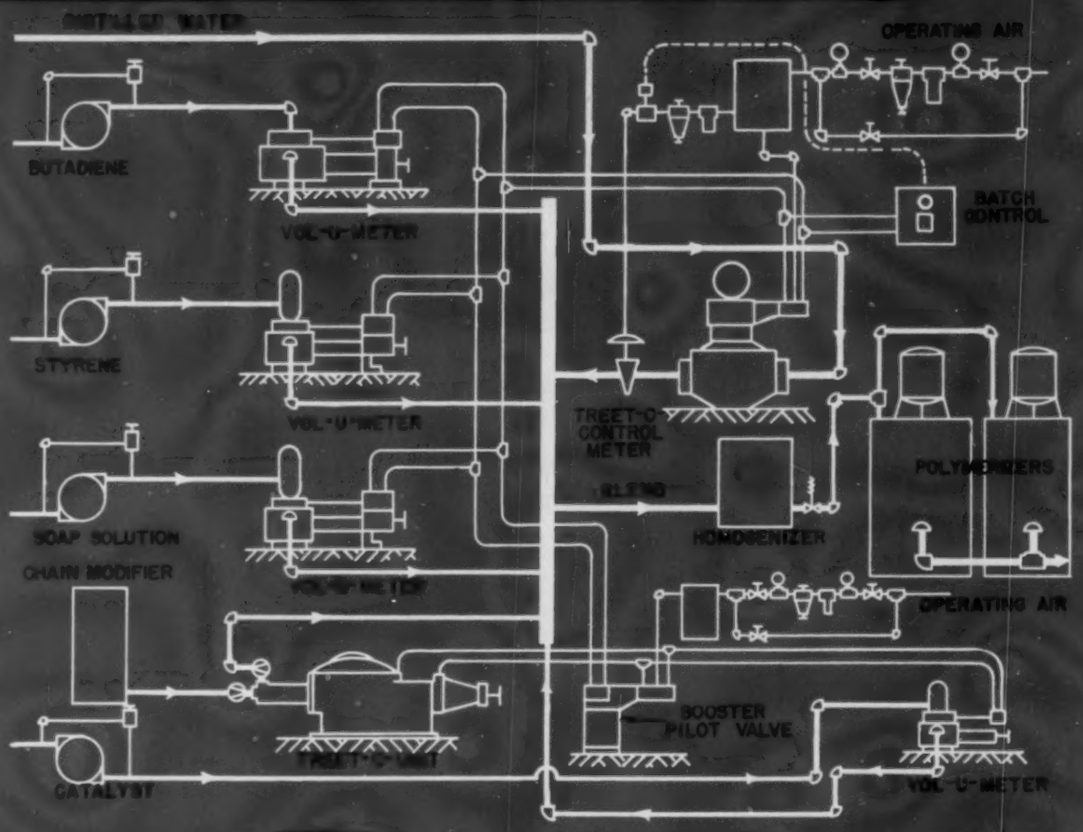


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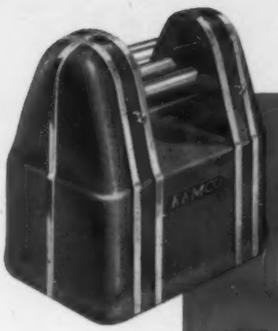

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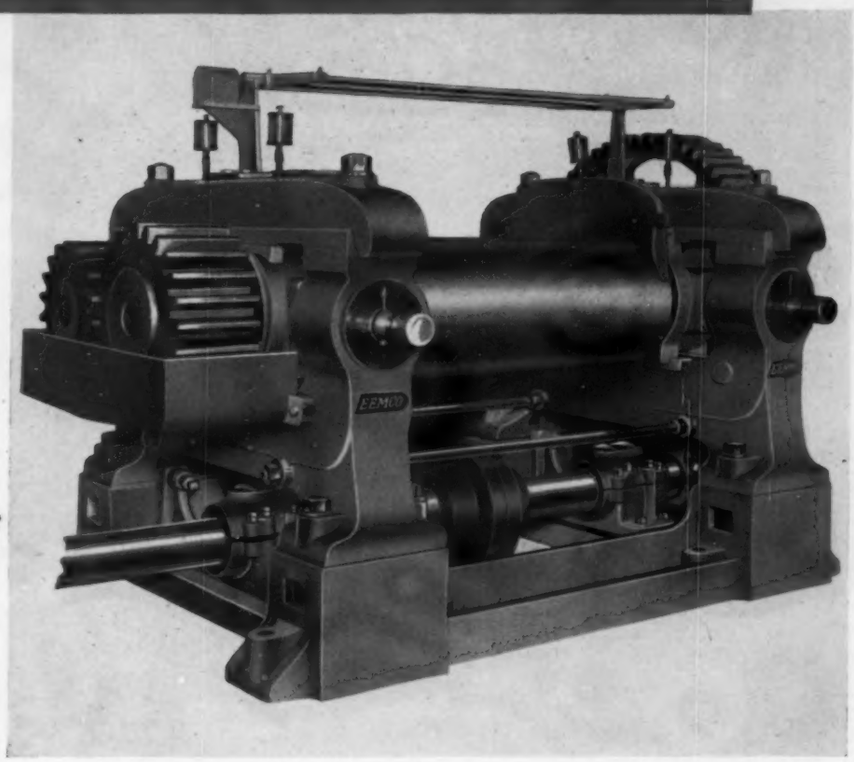


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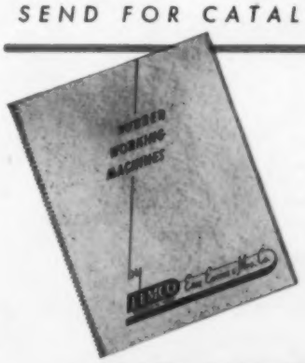


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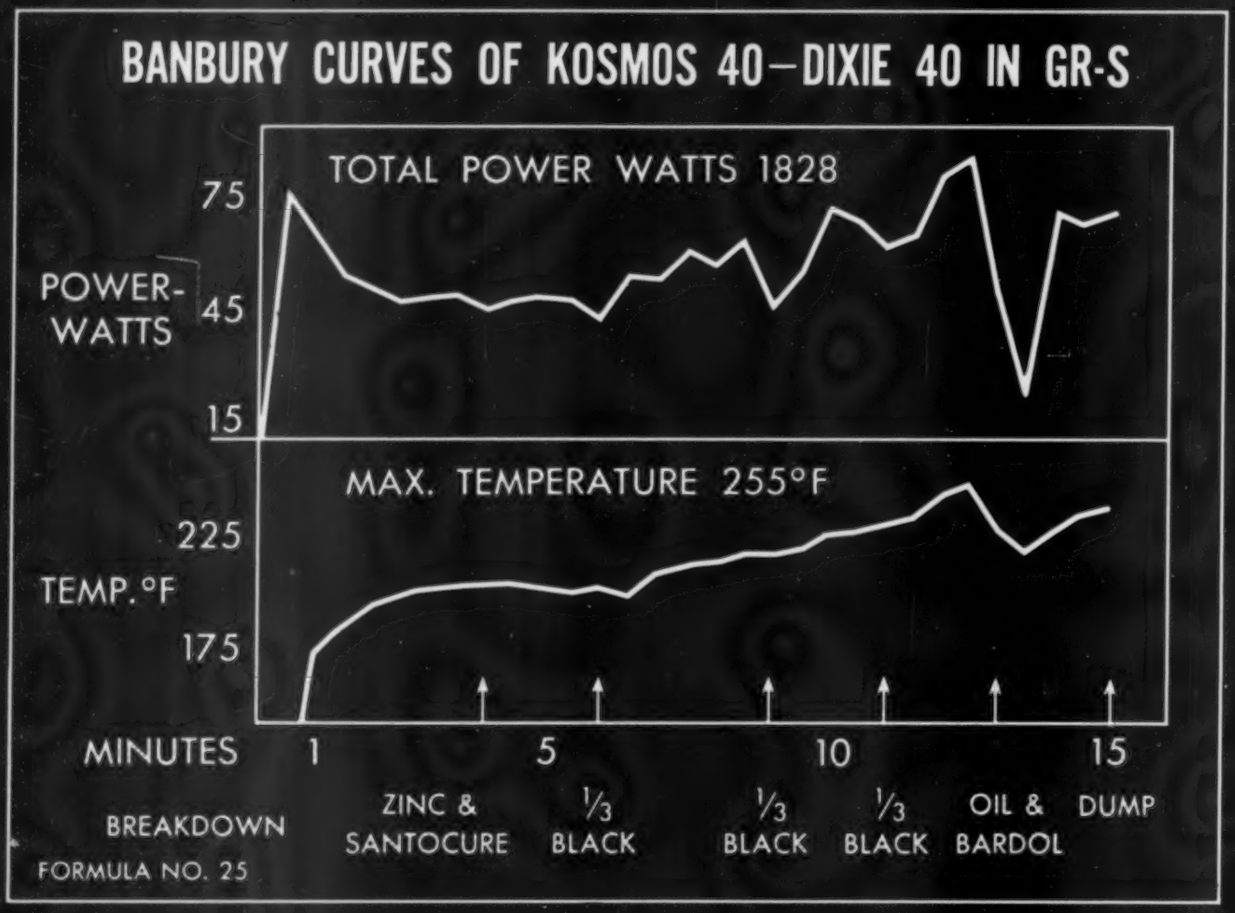


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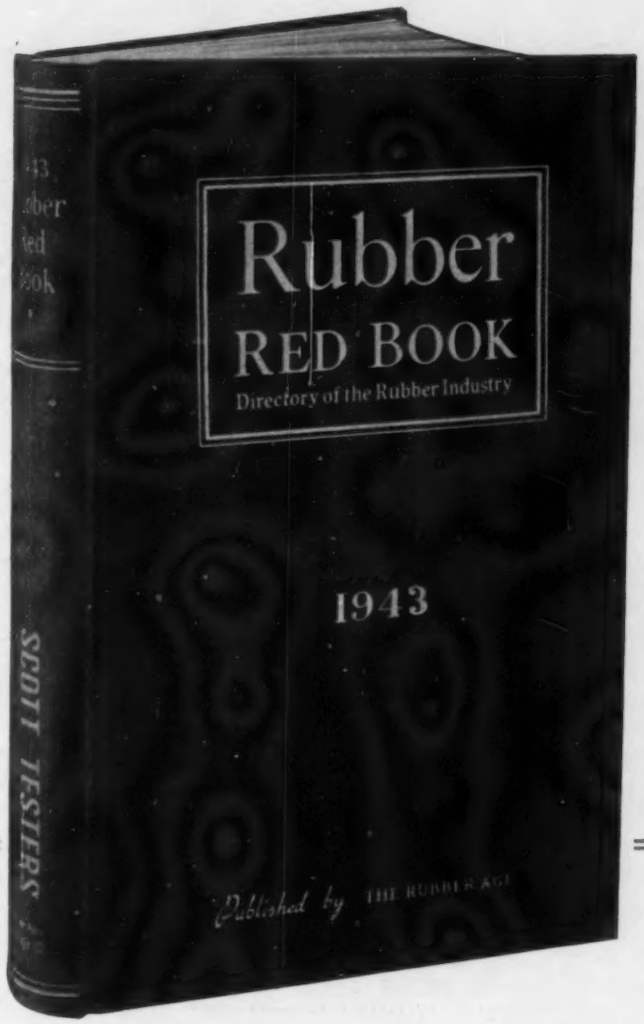


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| | Mol. Wt. | Color and Form | Boiling Point | Cryst. or Melt. Point | Sp.G. | Lbs. per Gal. | Refrac. Index | Evap. Rate Oms/sq. cm/hr/ 100°C | Solubility in Water | Retentivity in N/C | Retentivity in Ac/C | Light Fastness in N/C | Light Fastness in Ac/C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tricresyl Phosphate | 368 | Colorless liquid | 295°C/13 mm | Non-cryst., solid at −35°C | 1.165/20°C | 9.7 | 1.556/20°C | 0.00000708 | Less than 0.002% at 85°C | 100 plus | 0 | Poor | — |
| Triphenyl Phosphate | 326 | White flakes | 245°C/11 mm | 48.5°C | 1.268/60°C | 10.5 | ——— | 0.00000028 | 0.001% at 34°C<br>0.002% at 54°C | 100 | 80 | Poor | Fair |
| Santicizer 8 | 199 | Light amber liquid | ——— | ——— | 1.188/25°C | 9.9 | ——— | 0.0002659 | 0.13% at 23°C<br>0.213% at 48°C | 100 | 90 | Poor | Good |
| Santicizer 9 | 171 | White granules | ——— | 105°C | 1.313/25°C | 10.9 | ——— | 0.000053 at 65°C | 1% at 34°C | 25-30 | 25-30 | Poor | — |
| Santicizer B-16 | 336 | Colorless liquid | 219°C/5 mm | Below −35°C | 1.097/25°C | 9.15 | 1.490/25°C | 0.0000881 | 0.0012% at 30°C | 100 | 20-30 | Excellent | Excellent |
| Santicizer E-15 | 280 | Colorless liquid | 190°C/5 mm | 20°C | 1.180/25°C | 9.84 | 1.498/25°C | 0.0001106 | 0.0175% at 30°C | 100 | 100 | Excellent | Excellent |
| Santicizer M-17 | 266 | Colorless liquid | 189°C/5 mm | Below −35°C | 1.220/25°C | 10.2 | 1.584/25°C | 0.000221 | 0.09% at 30°C | 100 | 100 | Excellent | Excellent |
| Dibutyl Phthalate | 278 | Colorless liquid | 206°C/20 mm | −35°C | 1.047/20°C | 8.75 | 1.490/25°C | 0.000221 | 0.001% at 30°C | 100 | Less than 20 | Excellent | — |
| Diethyl Phthalate | 222 | Colorless liquid | 295°C | −0.3°C | 1.123/20°C | 9.35 | 1.503/20°C | 0.000617 | 0.058% at 30°C | 100 | 100 | Excellent | Excellent |
| Dimethyl Phthalate | 194 | Colorless liquid | 282°C | 0°C | 1.196/15.6°C | 10.0 | 1.515/20°C | 0.001925 | 0.4% at 32°C<br>0.6% at 63°C | 100 | 100 | Excellent | Excellent |
| Diphenyl Phthalate | 318 | White powder | ——— | 69°C | 1.28/25°C | 10.68 | 1.572/74°C | ——— | Insol. | — | 20 | Poor | — |

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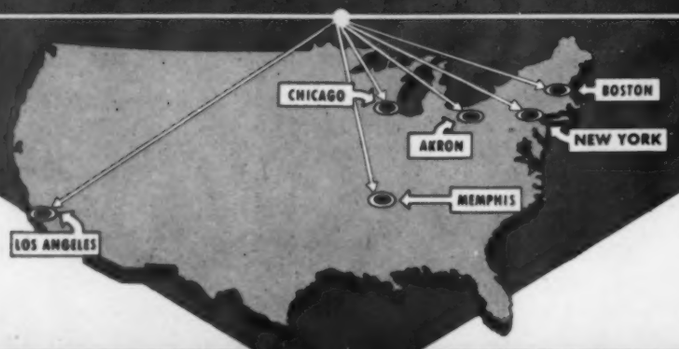


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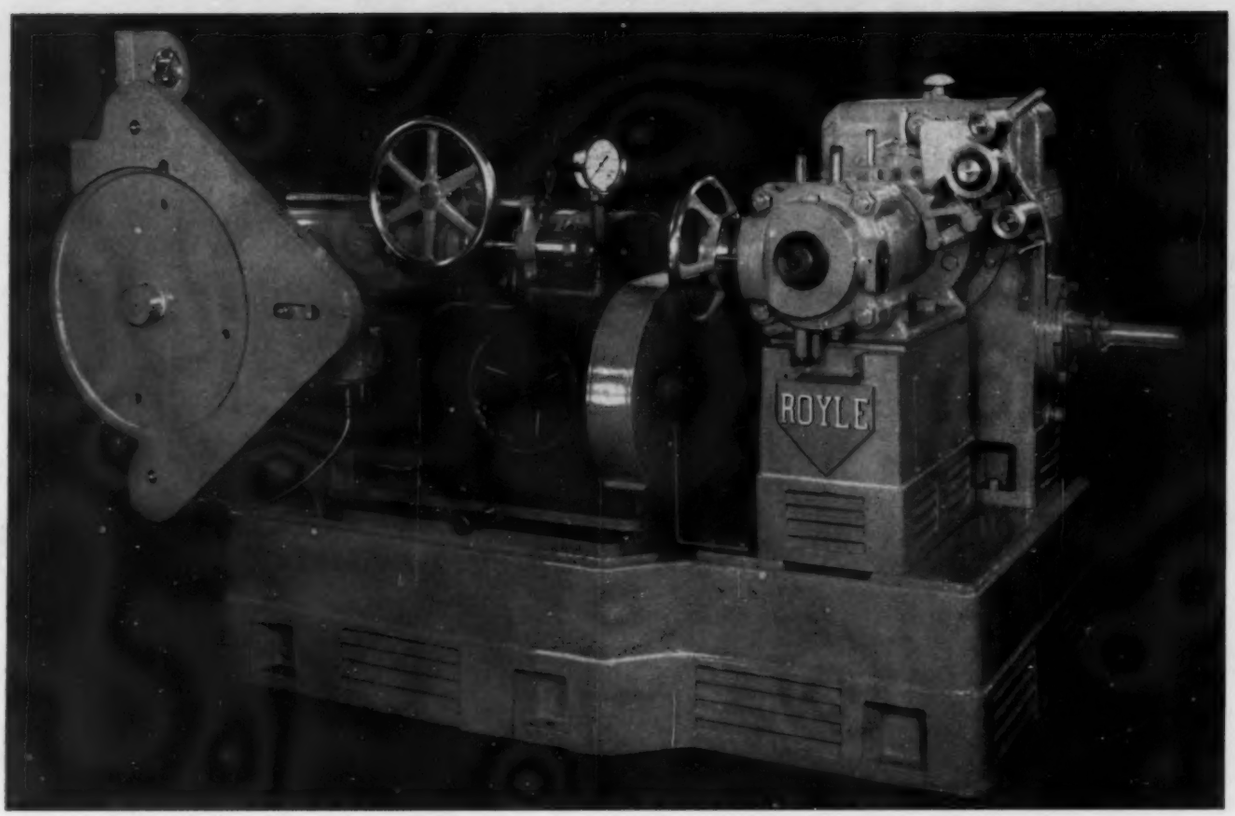


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VOL. 54, No. 6 MARCH, 1944

# Compounding of GR-S for Heat Resistance

By JOHN G. HENDRICKS

*Research Labs., National Lead Co., Brooklyn 1, N. Y.*

MOST GR-S compounds when subjected to heat show a pronounced tendency toward shortness. Immediately upon contact with heat they start to lose their rubbery properties and shift toward a material only semi-elastic in character. This action is not reversible. The material does not regain its elasticity when cooled. In addition to loss of elasticity, the vulcanizate lacks stability and uniformity of characteristics. As a result the compound usually cannot fulfill its intended function properly and only a short period of efficient service life can be expected.

The effect of heat upon the individual physical properties of GR-S compounds is well known. The most critical properties, modulus and elongation, suffer marked changes. The effect upon elongation is particularly drastic. Elongation drops rapidly from its original value and continues to drop as the time of exposure to heat increases. Modulus climbs rapidly and usually tends to approach the ultimate tensile strength in a short time. Tear resistance, poor at the outset, is greatly decreased while hardness is, of course, increased. Flexibility, hysteresis loss and other dynamic properties show changes commensurate with the shift in state of cure.

The mechanism of heat degeneration is as yet a matter of speculation. Conflicting data from sources accepted as reliable, as well as from unpublished work, serve only to emphasize the uncertainty of the grounds upon which present hypotheses are based. Sulfur level is certainly an important factor. It seems probable that a certain type of sulfur linkage, either directly or by catalytic action, is responsible to a large extent for the instability of GR-S compounds toward heat.

In the compounding of natural rubber, heat stability can be effectively accomplished by either of two methods. The more general of these is protection against oxidation by the use of antioxidants. This measure cannot contribute effectively to the solution of this problem since the compounds under consideration already contain antioxidant added to the polymer itself as an

Note: This article is based on a talk given by the author before the Chicago Rubber Group on February 4, 1944.

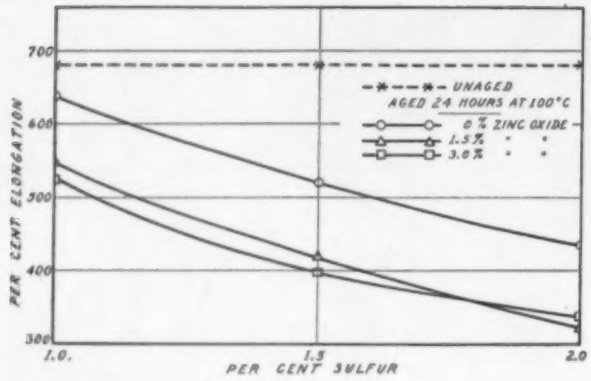


FIG. 1

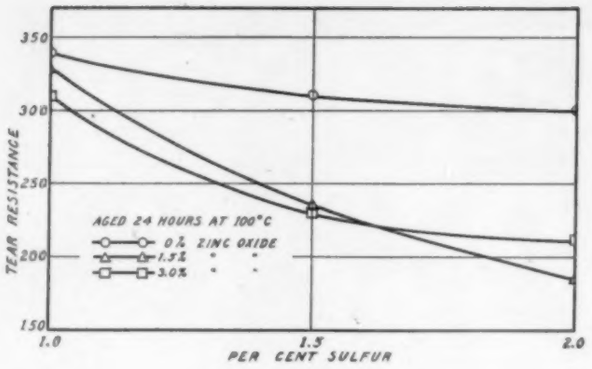


FIG. 3

inhibitor of polymerization. The second method found to be effective in the compounding of natural rubber for heat resistance, is the use of low sulfur—either low sulfur as such or very low sulfur as derived from a sulfur-bearing ultra accelerator. Unfortunately the action of sulfur-bearing ultra accelerators in GR-S seems to differ from their action in natural rubber to such an extent that this method of imparting heat resistance to the compound is not feasible at the present time.

The alternative procedure, using low sulfur as such, is also heavily dependent upon the action of the acceleration if practical and economic requirements are to be met. Several investigators have shown that low sulfur levels are effective in retaining the original physical properties of the GR-S vulcanizate. Practical application of this knowledge has been hampered primarily for three reasons, namely:

(1) The long, impractical curing times required.

(2) Lack of a sufficiently powerful accelerator combination which, by "driving home the sulfur," would impart the fullest measure of heat resistance to be achieved by this method.

(3) The inefficiency of acceleration that makes necessary the use of large quantities of accelerator.

(1) "Litharge Activated Acceleration in Buna S Stock," Research Labs., National Lead Co. (1943).

Obviously these reasons may all be ascribed to the decreased relative activity of rubber accelerators in GR-S as compared with their activity in natural rubber.

It has previously been shown *(1)* that when a relatively small amount of litharge, viz: 1.5%, is used to activate about 1.0 part of a thiazole type accelerator, GR-S vulcanizates of excellent physical properties may be obtained in a relatively short curing time. Such a combination is too fast for use in natural rubber; it is so fast in natural rubber that it is definitely scorchy. In GR-S, however, the litharge-thiazole combination has been found to be safe as well as fast.

Litharge-thiazole GR-S compounds are characterized by their fast curing rate, processing safety, high modulus and good general physical properties. A combination of about 0.5% each of litharge and thiuram type accelerator (TTMS) imparts similar characteristics and is well suited for GR-S natural rubber or GR-S reclaim mixtures as well as for straight GR-S.

The designation "activator" for both litharge and zinc oxide is perhaps unfortunate. The co-use of these metallic oxides is often desirable not only because they differ greatly in the intensity of their activation, but also because each imparts definite, specific characteristics. Litharge is itself an accelerator. When used in moderate quantities (0.5 to 2.0%) with normal acceleration it is a powerful secondary accelerator. Consequently the percentage of litharge to be used in a given

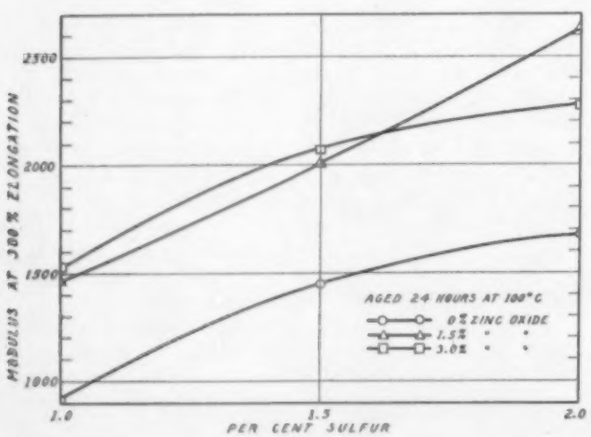


FIG. 2

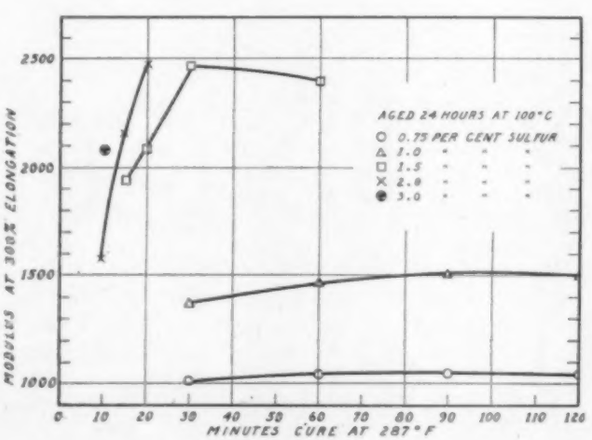


FIG. 4

TABLE I—EFFECT OF SULFUR AND ZINC OXIDE

| Stock | % ZnO | % S | T/287° F. | Tensile Strength | % Elong. | T-300 | Shore | % Rebound [1] | % Set [2] | Tear Resistance [3] | Heat Build-Up, [4] C.° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Unaged* | | | | | | |
| A | 0 | 1.0 | 30 | 2850 | 710 | 600 | 56 | 37 | 14 | 35 | 77 |
| F | 0 | 1.5 | 20 | 3040 | 680 | 800 | 56 | 37.5 | 22 | 35 | 83 |
| L | 0 | 2.0 | 20 | 2950 | 685 | 830 | 57 | 39 | 25 | 35 | 58.5 |
| B | 0.75 | 1.0 | 30 | 2800 | 710 | 705 | 61 | 39 | 14 | 38 | 77 |
| G | 0.75 | 1.5 | 20 | 3050 | 715 | 785 | 60 | 39 | 22 | 34.5 | 77 |
| C | 1.0 | 1.0 | 30 | 3070 | 700 | 705 | 60 | 40 | 14 | 37.5 | 74.5 |
| H | 1.0 | 1.5 | 20 | 3080 | 700 | 800 | 60 | 38.5 | 23 | 38 | 62.5 |
| D | 1.5 | 1.0 | 30 | 3550 | 680 | 930 | 61 | 39 | 17 | 36.5 | 70 |
| J | 1.5 | 1.5 | 20 | 3470 | 670 | 910 | 61 | 40 | 22 | 34 | 60 |
| M | 1.5 | 2.0 | 20 | 3590 | 670 | 980 | 62 | 40 | 25 | 34 | 54.5 |
| E | 3.0 | 1.0 | 30 | 4000 | 665 | 945 | 62 | 40 | 15 | 38 | 62 |
| K | 3.0 | 1.5 | 20 | 3600 | 665 | 1190 | 62 | 40.5 | 20 | 34 | 58 |
| N | 3.0 | 2.0 | 20 | 3600 | 670 | 1025 | 62 | 40.5 | 25 | 32.5 | 48 |
| O | 5.0 | 2.0 | 20 | 3580 | 630 | 1065 | 62 | 40 | 25 | 34 | 48.5 |
| | | | | | *Aged 24 hours @ 100° C.* | | | | | | |
| A | 0 | 1.0 | 30 | 2700 | 640 | 920 | 61 | 38.5 | 10 | 340 | — |
| F | 0 | 1.5 | 20 | 2810 | 520 | 1440 | 64 | 39 | 10 | 310 | — |
| L | 0 | 2.0 | 20 | 2680 | 440 | 1680 | 67 | 39 | 10 | 300 | — |
| B | 0.75 | 1.0 | 30 | 2860 | 600 | 1080 | 67 | 41 | 7 | 330 | — |
| G | 0.75 | 1.5 | 20 | 3060 | 520 | 1450 | 69 | 41.5 | 11 | 350 | — |
| C | 1.0 | 1.0 | 30 | 3050 | 580 | 1230 | 67 | 41.5 | 9 | 330 | — |
| H | 1.0 | 1.5 | 20 | 2900 | 480 | 1600 | 69 | 41.5 | 7 | 310 | — |
| D | 1.5 | 1.0 | 30 | 3120 | 550 | 1480 | 70 | 41.5 | 3 | 330 | — |
| J | 1.5 | 1.5 | 20 | 2880 | 420 | 2010 | 74 | 42.5 | 1 | 235 | — |
| M | 1.5 | 2.0 | 20 | 2760 | 330 | 2650 | 74 | 43 | 2 | 185 | — |
| E | 3.0 | 1.0 | 30 | 3380 | 530 | 1510 | 69 | 41.5 | 4 | 310 | — |
| K | 3.0 | 1.5 | 20 | 3000 | 400 | 2080 | 73 | 43 | 5 | 230 | — |
| N | 3.0 | 2.0 | 20 | 2770 | 340 | 2280 | 74 | 43.5 | 3 | 210 | — |
| O | 5.0 | 2.0 | 20 | 2940 | 370 | 2440 | 74 | 44 | 5 | 275 | — |

(1) Modified Hock rebound. (2) Break-set. (3) Pounds per 0.1 inch. (4) Goodrich Flexometer operated at room temperature. Load 100 psi, stroke 0.2". 30 min. test.

compound is more critical than the percentage of other activators. This difference in activity must, of course, be considered in any evaluation of litharge as an "activator."

The basic compound used in this investigation was the conventional "tread-type" formula. Results and conclusions are based strictly upon the action of the acceleration and variables in the following compound:

BASIC COMPOUND

| | |
|---|---|
| GR-S (Institute) | 100. |
| E.P. Carbon Black | 50. |
| FBS Litharge | 1.5 |
| Benzothiazyl Disulfide | 1.0 |
| Bardol | 5. |
| Sulfur | Variable |
| Zinc Oxide | Variable |

The effect of sulfur and zinc oxide level is presented in Table I. In Figs. 1, 2 and 3 some of the more important physical properties are plotted at equivalent state of cure against various sulfur and zinc oxide levels.

Unquestionably, low sulfur used in conjunction with the litharge-thiazole combination gives vulcanizates greatly superior in their heat stability. Modulus, instead of showing the climbing action characteristic at normal sulfur levels (Fig. 4), tends to retain its original value. Retention of elongation and tear resistance is outstanding. Hardness and dynamic properties tend to remain unchanged upon the application of heat.

Of equal importance is the fact that the low sulfur compounds so accelerated are extremely practical (Fig. 5). Time of cure may be readily adjusted as desired, from a relatively short period to longer periods.

The range of practical curing temperatures, as shown by investigation of pressures between 30 psi and 80 psi steam, is extremely wide. The extremely broad curing range is of great practical interest. As a specific example, a 1% sulfur stock having an optimum cure at 30 minutes was vulcanized for five hours. Following an exposure to heat (100° C.) for 24 hours, the elongation of this "overcured" compound had decreased only from an original value of 550% to 500%. Table II indicates this stability on overcure. Thus, not only are individual cures stable toward heat, but once optimum cure is reached, there is a strong tendency for the values of the physical properties at optimum cure to be retained despite additional time of cure or exposure to heat.

The properties of zinc oxide, which was one of the variables in this group of experiments, are of considerable interest when it is used in conjunction with the litharge-thiazole accelerator combination. These properties are such that under proper conditions zinc oxide can be used to a limited extent as a modifying agent.

At normal sulfur levels zinc oxide contributes heavily toward decreased heat stability. At low sulfur levels, however, zinc oxide content may be used effectively in the litharge-thiazole compound to modify certain properties without detracting greatly from heat stability. These properties include modulus, hardness and dynamic properties (Fig. 6). For example, zinc oxide may be used to increase modulus without causing the rapid climbing action characteristic of the unstable normal sulfur vulcanizates.

Figure 7 illustrates the effect of increasing time of exposure to heat of GR-S vulcanizates compounded

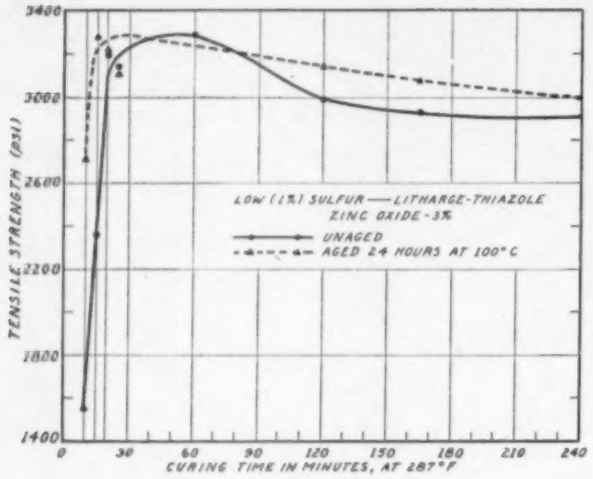


*FIG. 5*

with varying sulfur levels. In this case the zinc oxide content was fixed at 3.5%. As a supplement to the graphical data, the exposure time at 100° C. necessary to cause a 50% decrease in original elongation was noted. It was found that an exposure time of 18 hours was sufficient to cause such a reduction in the normal (2%) sulfur compound. The vulcanizate containing 0.8% sulfur maintained over 50% of its original elongation for 20 days at 100° C. Considering the severity of the test, the stability of this compound should be of interest in most practical applications. The retentivity of the 0.5% sulfur vulcanizate clearly indicates the results that may be obtained with low sulfur. This stable compound retained over 50% of its elongation after a full month of exposure to heat at 100° C.

The use of adequately accelerated low sulfur, therefore, results in practical GR-S compounds which will retain their original characteristics over a wide curing range and which are stable toward heat. The stabilization of modulus, elongation, tear resistance and hardness is unquestionably generally desirable. The effect of stabilizing dynamic properties is also important and must be considered. Sulfur and zinc oxide levels seem to have small influence on resistance to flex-cracking, provided tests are made at equivalent state of cure.

(2) "Synthetic Rubber Compounding," Bulletin No. 3, Naugatuck Chemical Div. of U. S. Rubber Co. (1943).

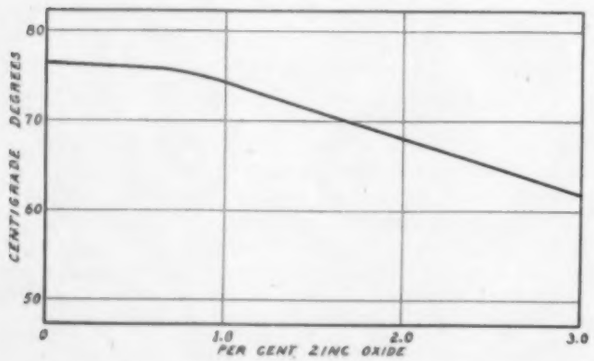


*FIG. 6*

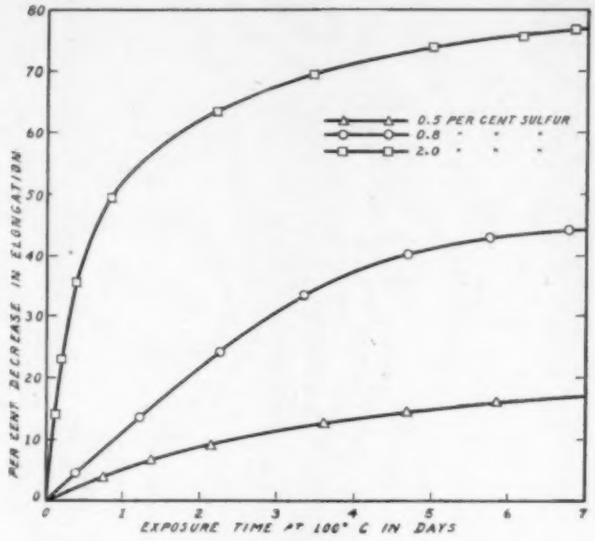


*FIG. 7*

However, resistance to flex-cracking is somewhat lowered as the state of cure is increased. A compound stable toward heat tends to minimize any advance in state of cure and thus aids in retention of flex-cracking resistance.

The effect of sulfur and zinc oxide content on heat build-up should be examined most carefully. Tests *(2)* have shown that at equivalent state of cure, heat build-up tends to be independent of sulfur level, depending to some extent on the load and duration of test. Unfortunately it is the changes in physical properties brought about by heat degeneration — those changes which rob the compound of its rubber-like characteris-

TABLE II—EXTENDED CURING RANGE OF LITHARGE ACTIVATED GR-S

*(1% Sulfur and 3% Zinc Oxide)*

| T/287° F. | Tensile Strength | % Elong. | T-300 | T-500 | Shore | Rebound |
|---|---|---|---|---|---|---|
| | | | *Unaged* | | | |
| 10 | 1530 | 760 | 385 | 860 | 58 | 36 |
| 15 | 2370 | 760 | 625 | 1480 | 59 | 37 |
| 20 | 3210 | 750 | 685 | 1650 | 59 | 38.5 |
| 25 | 2960 | 680 | 1080 | 2320 | 62 | 39 |
| 30 | 3150 | 630 | 1170 | 2280 | 63 | 38.5 |
| 60 | 3250 | 590 | 1090 | 2450 | 63 | 38 |
| 90 | 2880 | 570 | 1175 | 2475 | 63 | 38 |
| 120 | 2990 | 540 | 1210 | 2660 | 66 | 39 |
| 160 | 2840 | 510 | 1375 | 2800 | 66 | 39.5 |
| 240 | 2920 | 505 | 1480 | 2920 | 66 | 37.5 |
| | | | *Aged 24 hours @ 100° C.* | | | |
| 10 | 2690 | 660 | 1000 | 2000 | 62 | 39 |
| 15 | 3250 | 560 | 1500 | 2850 | 62 | 40 |
| 20 | 3160 | 530 | 1560 | 2950 | 65 | 40 |
| 25 | 3080 | 510 | 1640 | 2900 | 70 | 40.5 |
| 30 | 3050 | 490 | 1810 | — | 70 | 40.5 |
| 60 | 2910 | 470 | 1620 | — | 70 | 39.5 |
| 90 | 2930 | 470 | 1640 | — | 70 | 40 |
| 120 | 3120 | 460 | 1830 | — | 70 | 40 |
| 160 | 2900 | 440 | 1620 | — | 70 | 39 |
| 240 | 3000 | 420 | 1760 | — | 70 | 39 |

tics—that tend to reduce heat build-up. High sulfur compounds therefore tend toward lower heat build-up at the expense of elasticity. Whatever the importance of heat build-up may be, most applications requiring low heat build-up are equally dependent upon some rubber-like property. A tire, for example, must have sufficient elongation and elasticity to withstand shock. Further, in the design of compounds for dynamic use it is often essential that physical properties be maintained reasonably uniform during service.

A comparison of the action of normal and low sulfur compounds gives an insight into the relative merits of these compounds for a given application. The situation when normal sulfur is used is such that the heat generated instigates a cycle. In this cycle the quantity of heat generated is continuously decreased by small increments while elongation and tear resistance continuously suffer great decreases and modulus undergoes correspondingly great increases. The net effect of such action is, at best, short service life due to the loss of necessary elastic properties.

Low sulfur litharge-thiazole compounds, while starting from about the same value of heat build-up, tend to retain that value despite mechanical work done on the compound, or exposure of the compound to heat. The heat build-up of these compounds is neither increased nor decreased appreciably but tends to remain constant. Rubber-like properties, however, are retained to a large extent. In some instances an additional factor enters, which demands further study.

For example, the critical temperature of tire cord seems well within the range of temperatures likely to be encountered with straight GR-S truck tires. While low sulfur accelerated by the litharge-thiazole combination adequately protects the rubber compound itself against the heat generated, it cannot assume protection of foreign materials subject to deterioration by heat unless additional steps are taken. It is suggested that the stability and elasticity imparted by such compounding offers a logical starting point from which to attack the problem of maintaining both elasticity and low heat build-up under severe conditions.

In general, the investigation of the effect of sulfur level on GR-S compounds indicates that low sulfur compounds have much greater heat stability. The use of litharge-thiazole acceleration makes the practical application of low sulfur in GR-S feasible. Low sulfur compounds activated by the litharge-thiazole combination are relatively fast curing and adaptable to a practical range of curing rates. Superior heat resistance is further indicated by the extremely broad curing range.

The ultimate effect of the litharge-thiazole combination used with low sulfur is to impart stability and uniformity of performance and thereby greatly increase the period of efficient service life of the GR-S vulcanizate.

## Manufacture and Some Applications of Multipore

MULTIPORE, the filter material containing as many as 6400 perforations to the square inch, developed by the United States Rubber Co. several years ago, is now being used by chemical plants, food factories, medical manufacturers, coal and iron mines, steel mills, liquor distillers, and many other types of industry. This versatile material is also filtering fruit juices for shipment to combat areas. It is serving in the purification of insulin, aiding in the production of the magnesium metal which is lighter than aluminum, and speeding up the production of four-engine bombers.

Multipore may be traced back to the day 18 years ago when chemists at the laboratories were pioneering in the use of natural rubber latex for waterproofing raincoat fabric. Pinholes almost microscopic in size mysteriously appeared after the fabric had been heated in the drier. These holes were found to be the result of small explosions. Pockets of air were being trapped within the mesh of the fabric. When they were expanded by heat they exploded through the film of latex that had been spread on the fabric.

A remedy to eliminate this defect was found. Scientists reversed their finding to see just how many holes they could create in a square inch of latex film. After intensive research, they succeeded in blowing as many as 6,400 holes to the square inch, in sheets up to 42 inches wide and 20 yards long.

The present method of making the filter material is based on the factors which caused the pinholes in the original raincoat fabric. Latex is spread on a cured rubber blanket containing the desired number of nearly microscopic pits uniformly distributed. When this is heated the air trapped in each pit is expanded and blows a hole through the latex film.

These filter screens are made of either hard or soft rubber, and may be compounded to resist abrasion, high temperatures, alkaline and acid solutions, as well as certain oils and greases. Since they are made only from natural latex, now one of the most critical of all materials, the filter can be applied only to the most important products.

One of the paramount uses of this product is in the preparation and administration of blood plasma and whole blood as used in modern methods of transfusion. The filters serve to separate blood clots from whole blood, and "veils" or cloudiness which sometimes form in blood plasma.

Another important use is in silver plating the bearings of airplane engines. This, a new method, reduces plating time from six hours to one and a half hours. In addition to speeding output, the new technique employing anode holders of multipore creates a silver plate of greater uniformity, with greater wearing quality, and a smoother surface.

In soft coal mines, coal dust which formerly was lost is now recovered from processing water by these rubber filters. This saving increases production from 200 to 300 tons per day at individual mines.

Two years ago a steel company installed the first multipore filter in the flotation process of separating ore. This was an experiment to determine longevity. In this severe service, where fine, sharp particles of iron ore are separated, the conventional filter material lasted only a week. Multipore filter showed no signs of wear at the end of a month. As a result of these tests, other units were converted to using these multipore filters. None has worn out. Many have been in continuous use almost two years.

# Cellular Rubbers

By LOUIS P. GOULD

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THE nomenclature of the rubber products which are to be discussed in this article has not been too exact. There are patents entitled Froth Rubber, Expanded Rubber, and Cellular Rubber—all of which refer to the same product. Also, one patent named Cellular Rubber describes a product which is similar to that of another patent called Micro-porous Rubber. In addition, Sponge Rubber, Porous Rubber, Foam Rubber and other names have been used rather loosely and manufacturers themselves have not been in complete agreement as to the correct names for some of these products.

In most groups of products there is considerable similarity between the different members of the group but this is not true in this family of Cellular Rubbers. For example: A Micro-porous hard rubber battery separator is quite dissimilar to a Latex Foam Rubber cushion but they do have one thing in common—they are both cellular, that is, consisting of cells which are defined as small hollow receptacles.

Our first problem then is to classify and define the various products which we have included in the Cellular Rubber family. It is not expected that everyone will agree with the proposed classification. It is believed that there exists a need for a classification and it is hoped that the one given in Table I will at least serve as a stepping stone to a better one. The term "rubber" has been used to include both natural and the synthetic types.

## Classification

Cellular rubbers have been divided according to cell structure of the finished products into three classes: Class 1—Multi-cellular Rubbers, with open cell structure; Class 2—Uni-cellular Rubbers, with closed cell structure; and Class 3—Micro-cellular Rubbers, with cells too small to be readily visible to the naked eye. Related products are impregnated fibers and cellular products made from materials other than rubber. Many of the products are made both in soft and in hard (ebonite) rubber. Multi-cellular rubbers have been divided into Sponge Rubbers and Latex Foam Rubbers and Micro-cellular rubbers have been divided into Micro-porous and Multi-porous sheet rubbers. The reason for the division is obvious.

The words "Sponge Rubbers" to cover the entire group of products have been avoided, because by definition a sponge is a material *remarkable for its power of absorbing water*. Cellular Rubbers with an open-cell structure will absorb water and those made from slab rubbers are known as Sponge Rubbers. Their cell structure is inter-connecting or inter-communicating in the *finished* products. The word finished is emphasized because some of the products of this group have a closed-cell structure in earlier stages of their manufacture. Articles which are made to compete with natural sea sponges, such as artificial bath sponges, will be referred to as Rubber Sponges—the order of the two words is reversed to identify the one particular product.

Products of Class 1, made from rubber latices, will be designated as Latex Foam Rubbers. Products of the closed-cell type certainly should not be classified as Sponge Rubbers because by their very nature they are resistant to the absorption of water. Manufacturers of products with closed cell structure have objected to the word "Sponge" being used in connection with their product which is not only resistant to absorption of water, but is actually used in water for floats and buoys. Products of Class 2 will be referred to as Expanded Rubbers—the name used in the patents of Marshall, Denton and Roberts. The name aptly describes what happens at one stage of the manufacturing process when *rapid* expansion of the mass takes place. While the name Cellular has heretofore been used only for

TABLE I.—CLASSIFICATION OF CELLULAR RUBBERS AND RELATED PRODUCTS

1. *Multi-Cellular (Open-cell structure)*
   - (a) Sponge Rubbers—Made from slab rubbers
     - (1) Press cured
     - (2) Steam cured
     - (3) Oven cured
   - (b) Latex Foam Rubbers—Made from rubber latices
     - (1) Mechanically foamed latex
     - (2) Blown latex
     - (3) Miscellaneous processes
2. *Uni-Cellular (Closed-cell structure)*
   - (a) Expanded Rubbers—Made from slab rubbers
     - (1) By external gassing
     - (2) By incorporating gas forming ingredients in the compound
3. *Micro-Cellular (Cells not readily visible to the naked eye)*
   - (a) Micro-porous rubbers—Made from rubber latices
   - (b) Multi-porous sheet rubbers—Made from rubber latices
4. *Related Products*
   - (a) Impregnated Fibers (Reticulated or net-work structure)
   - (b) Products made from materials other than rubber (Various Structures)
     - (1) Rigid and non-rigid plastics
     - (2) Cellulose sponges
     - (3) Foams made from glass

Note: This article was presented at the Symposium on The Applications of Synthetic Rubber sponsored by the American Society for Testing Materials held at Cincinnati, Ohio, on March 2, 1944. Written discussion is invited by the author.

products of Class 2 all three classes are certainly cellular—that is, consisting of cells which are defined as small hollow receptacles. This is the only word which seemed to be descriptive of the entire group. Cellular, without the modifier "Closed-cell", does not *accurately* differentiate the products of Class 2 from the other classes.

The name "Chemically Blown" which has been used to identify the Sponge Rubbers included in the open-cell group is no longer a distinguishing characteristic of this group alone because much of the production of the closed-cell group, all of which was formerly made by externally gassing the compound, is now made by the use of chemical blowing agents incorporated into the compound. The suggested classification is shown in Table I.

## Processes for Making Cellular Rubbers

Sponge Rubbers are made by incorporating into plasticized slab rubbers an inflating agent such as sodium bicarbonate together with proper vulcanizing ingredients, softeners, fillers and age resisters. During the vulcanization process a gas is produced which expands the mass. The bulk of this type of sponge rubber is press cured in molds although a closely related type is cured in loaves or rods either in hot air ovens or steam autoclaves. This latter type is the one from which such products as rubber sponges are made and is believed to be one of the earliest cellular rubber products. Quite a bit of waste results due to cutting up the cured loaf, which except for size somewhat resembles a loaf of bread. Sponge rubber manufacturing is in some respects similar to the baking industry. It is said that the first rubber sponges were made in Russia and were the result of an observation made after a rubber cement plant had been completely destroyed by fire.

Sponge Rubbers have been divided into three groups depending upon the method of vulcanization. These three methods of vulcanizing are used to produce entirely different finished products. This is not true of solid rubber products nor is it true of other types of cellular rubbers as, for example, with Latex Foam Rubber very little difference in the structure of the end product results if it is vulcanized in steam, hot air ovens or in hot water. One method of producing

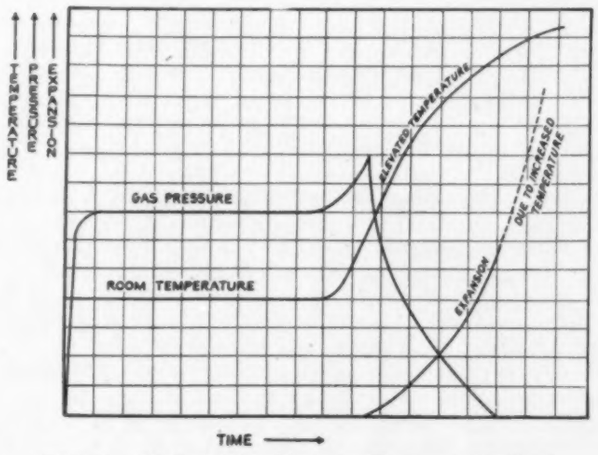


*FIG. 1—Carbon Dioxide Low Pressure Method.*

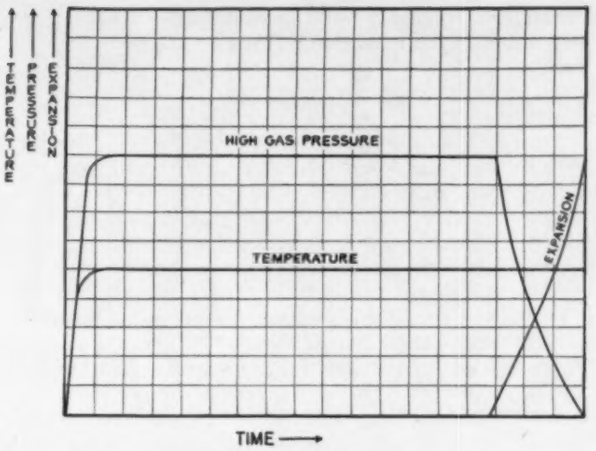


*FIG. 2—Nitrogen High Pressure Method.*

Sponge Rubbers by externally gassing the compound with carbon dioxide *(1)* is shown in Fig. 1.

The uncured stock is placed either directly or in a ventilated mold in a steam jacketed autoclave which is charged with carbon dioxide gas at room temperature. After a gassing period the temperature of the inside chamber is raised by admitting steam into the outer chamber of the autoclave. The heat causes an increase in the pressure of the gas in the autoclave. After the stock has been sufficiently warmed and saturated with gas the pressure in the inner chamber is slowly released through an orifice while the heating is continued until vulcanization is complete. The expansion of the mass is due to the decrease in external pressure and to the continued rise in temperature which increases the internal pressure of the trapped gas.

Many sponge rubber products must be put through mangles or wringer rolls to break up the closed cells and make them inter-communicating. An interesting story was told by Mr. Glen H. Willis *(2)*, who years ago while working on the problem of making rubber sponges, passed through his laboratory mill some of the rubber sponge trials which he had previously made and discarded because they had collapsed and shrunk. He was surprised when the cells were broken and filled with air and the flat shriveled tubes developed into good rubber sponges. This was an important discovery and the method of breaking up closed cells mechanically by passing the sponge rubber through tight wringer rolls is still a standard practice.

Latex Sponge Rubbers are ordinarily made by whipping air into rubber latices *(3)*. The process is similar in some respects to beating up egg whites or whipping cream in a household mixer. After the foam is made a delayed coagulant is added and the foam poured into molds which are completely filled. After gelling has taken place, the molds are placed in water, steam, or hot air ovens and the foam vulcanized. Another process consists of adding cooled liquid butane in the form of an emulsion to the latex after which foaming is accomplished by rolling the mixture in drums which are partly submerged in warm water. The remainder of the process is similar to that of the first method mentioned. Many other processes such as freezing latex *(4)*, using crushed ice particles to form the cells or using weak blowing agents in conjunction with a vacuum *(5)* to facilitate sponging, have been used.

Expanded Rubbers with a closed-cell structure are made by subjecting the compound to a gas such as nitrogen under high pressures *(6)*. Under these conditions a certain amount of gas dissolves in the compound. At the end of a semi-curing period the gas pressure is lowered causing the mass to rapidly expand and myriads of individual non-connecting gas-tight cells are formed. The semi-cured pieces are then given a final cure. This process is illustrated graphically in Fig. 2. In this process the uncured mass is placed in a high pressure autoclave and subjected to a pressure of nitrogen of approximately 4500 psi. The temperature is maintained constant throughout the cycle and at the end of a semi-curing period the gas pressure is rapidly reduced causing the mass to expand. The gassed semi-cured pieces are then given a final cure. This product is also being made by incorporating a gas-inflating material in the compound, semi-curing in a first mold similar to the manner of curing solid rubber articles, removing from the mold, at which time considerable expansion takes place, and then giving the product a final cure in a second mold which is slightly larger than the expanded semi-cured piece. The two stage process is necessary to get a product with a completely closed-cell structure.

Micro-cellular rubbers have been classed as either micro-porous or multi-porous to distinguish between two distinct types. Micro-porous *(7)* rubbers are made by curing wet coagulums under conditions which will trap the water in the product during vulcanization. The cells in the finished product are microscopic in size. Micro-porous rubber could be included with open-cell type of cellular rubbers but differs from them mainly in cell size. Multi-porous *(8)* products, consisting of porous sheets made from latices, derive their porous characteristics from many minute and uniformly spaced holes that extend perpendicularly through the sheet. They are made by spreading latex on a pitted blanket. The latex completely covers all the pits in the blanket surface but does not run down into them. Thus air is trapped in each little pit. Heat is then applied to the under surface of the blanket by a steam platen and as the belt becomes hot the air in the pits expands blowing little bubbles into the film of latex. When the bubbles burst, small holes are left in the film of rubber corresponding in size and number to the pits in the blanket surface. The word, "expanded", is also used in connection with this product and represents the material obtained by elongating the uncured sheet and then vulcanizing. This, of course, changes the shape of the pores.

A few related products containing little or no rubber may be mentioned because they are similar to the cellular rubbers and in some cases compete with them. Products with a reticulated network structure are made by impregnating hair, glass fibers, steel wool or other materials with binders such as rubber latices or reclaimed rubber dispersions. These products are sometimes shaped into definite configurations. They should not be classified with Cellular Rubbers because the amount of rubber used in their manufacture is small as compared with the amount of other materials used. Cellular rigid products are currently being made from thermoplastic resins such as polystyrene, cellulose acetate, and others, by mixing the resin with a blowing agent and extruding the material out of a hot die. It seems probable that there will be considerable future development in this field.

Multi-cellular products of the open-cell type are also being produced from plasticized vinyl chloride—a non-rigid plastic. Artificial sponges are made from cellulose *(9)* by incorporating sodium sulphate crystals into viscose, placing the mixture in a coagulating bath and precipitating the cellulose. The blocks so formed are leached with warm water to remove the sodium sulphate crystals which leave corresponding cavities. These sponges, like sea sponges, are remarkable for their power of absorbing water, becoming soft when wet without losing their toughness. Cell sizes vary according to the sizes of the crystals used. Foamed glass is a new product that is structurally strong, is a good insulator, and is fireproof.

The remainder of this article will deal only with the products classified as Sponge Rubbers, Latex Foam Rubbers and Expanded Rubbers as these constitute by far the largest portion of cellular rubber production.

## Sponge Rubber Theories

In looking over the records of an early experimenter, who was working on the problem of making Rubber Sponges, an entry was found in his notebook that he had discovered how to make an improved product by allowing the uncured stock to age or mature before curing—he recommended that the maturing period be 90 days. Since that time, considerable progress has been made but there is still much to be learned about Cellular Rubbers. One company is attacking the problem through the establishment of a Research Foundation at one of the larger Universities.

In the manufacture of sponge rubbers the following theories are important. They are based largely on work done with natural rubber.

1. *Uncured Mass Must be Plastic:* The mass must be sufficiently plastic so that it can be expanded by the gas or vapor pressure developed within the compound. Otherwise, the required cells will not be formed.

2. *Rate of Blow and Rate of Cure Must Be Balanced:* Blowing must not take place too early during the cure or the cell walls will collapse and the gas will escape, nor should it take place too late during the cure because it will not then be able to expand the partially cured stock. This fact is easily demonstrated by mixing a blowing agent into a well-plasticized compound which does not contain any vulcanizing agents. During the heating process only slight expansion of the mass takes place due to loss of gas through the material which fails to decrease in plasticity and increase in elasticity sufficiently to entrap the gases which are generated. With certain synthetic rubbers the required change of consistency for proper blowing takes place by increased polymerization due to the heating rather than by vulcanization as with natural rubber but the results are similar.

The various possible conditions of balance between the rate of cure and rate of blow are illustrated graphically in Fig. 3. Under (a) is shown a mediumly fast curing sponge rubber compound with a balanced rate of blow. These conditions result in a good product with medium sized cells and maximum amount of expansion. In (b) the rate of blow lags behind the rate of cure and a product results with a good skin, small cells, but not much expansion. In (c) the rate of cure lags behind the rate of blow and a product results which has a thin porous skin, large uneven cells and a medium amount of expansion. In (d) a faster

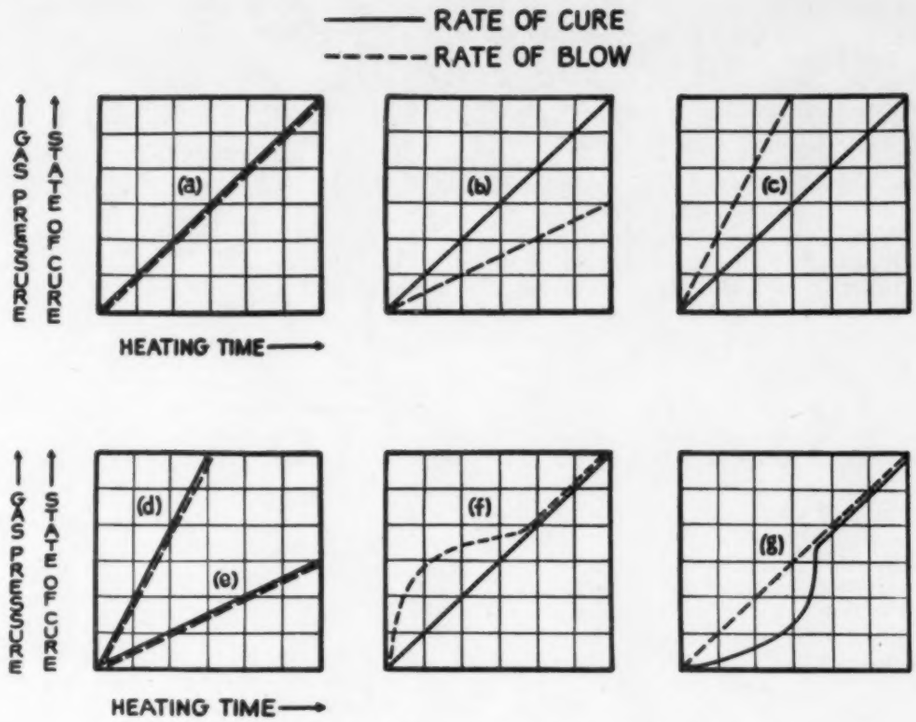


*FIG. 3—Rate of Cure versus Rate of Blow.*

curing compound is illustrated. In order to obtain the best product in this case the faster curing compound must be balanced with a faster blowing agent. Ammonium bicarbonate might be substituted for the sodium bicarbonate and stearic acid which were used in hypothetical case (a). In (e) we have represented a slower curing compound which calls for a blowing agent with a slower rate of reaction such as sodium bicarbonate without an acid. In (f) is shown the rate of blow obtained by the use of an auxiliary blowing agent and in (g) a rate of cure obtained by using a delayed-action type of accelerator or by adding a retarder to the compound. Figure (g), we believe, represents the best conditions. Figure (f) is of course similar. Balance between rate of cure and rate of blow can sometimes be changed by raising or lowering the temperature of cure which will affect the rate of blow differently. In practice it is sometimes difficult to distinguish as to whether the cure is too slow or the blow is too fast or vice versa as both sets of conditions result in a cured product of similar appearance.

Cells are formed during the early part of the curing period and for this reason the initial part of the curing or decrease in plasticity curve is very important in the manufacture of sponge rubbers. In Fig. 4 we have shown theoretical curing curves for three possible variations obtained with the same recipe. Since the curves all meet at a point which can be considered as the proper cure all three stocks would ordinarily be satisfactory for solid molded products. However the variation in initial rate of cure will cause considerable variation in cell structure of cured sponge rubber. The initial rate of cure is possibly more important in sponge manufacture than in the manufacture of any other type of rubber goods. It is exceedingly hard to control, being influenced greatly by changes in plasticity of the rubber and it varies with different lots of rubber and with different shipments of supposedly inert pigments.

3. *The Internal Pressure Must Exceed the External Pressure:* In an ordinarv press-cured sponge rubber mix the pressure developed within the mass during cure exceeds the external atmospheric pressure. In one process a weak blowing agent is used and the expansion is aided by reducing the external pressure by a vacuum. Articles which are cured in open steam usually contain water on the theory that the water will generate, at the curing temperature, an internal pressure which will exactly counterbalance the external steam pressure. The blowing is accomplished with a secondary blowing agent which increases the internal pressure above that of the external steam pressure. Sponging can be accomplished either by lowering the external pressure or by raising the temperature which increases the internal pressure.

4. *Rate of Heat Transfer Is Important:* An important factor in sponge manufacture is the *rate* of heat transfer. Many of the difficulties of sponge manufacture can be traced to the slow transfer of heat into the mix because of the low heat conductivity of rubber and the additional insulating due to the premature blowing of the outside layers of the sponge rubber. If a roll of stock is put in a vulcanizer the steam will heat the outer surface which will become porous and insulate the interior of the stock resulting in different sized cells from center to outside. A stock which will make a good sponge when sheeted out ½-inch thick and cured in open steam, will often not make a satisfactory sponge if an attempt is made to make a thicker sponge using a 1-inch thick stock preparation. Press cured sponge slabs often have the

top edges rounded due to heat being transferred into sides of stock from three directions while the center of the stock is only being heated from top and bottom. Articles such as sponge balls sometimes have a loose bottom layer due to premature blowing and curing of that part of the biscuit which is in direct contact with the hot mold. This takes place before the top and outer parts of the biscuit are heated to the blowing temperature. In order to obtain better heat transfer into compounds which are vulcanized in hot air ovens it is sometimes advantageous to saturate the air with water vapor in order to increase its conductivity. Superheated steam at atmospheric pressure has also been used. Thermal conductivities of the various polymers differ—being in general greater for the synthetic rubbers than for natural rubber.

To overcome these difficulties of heat transfer a process of making rubber sponges was developed in Europe which consisted of heating the mix in a steam-jacketed heater filled with water at the vulcanizing temperature and at the same time applying to the water a pressure sufficiently high to prevent expansion of the rubber mix until it had been evenly heated throughout. The pressure was then reduced while maintaining the water at the vulcanizing temperature and the gas-producing ingredients caused the mass to expand rapidly which resulted in rubber sponge with a uniform distribution of cells throughout its mass. The vulcanization took place in two stages, the warming up and semi-curing period and the final vulcanization period.

This method was improved upon by Lindemann *(10)*, who heated the mass in a chamber containing a mixture of a gas introduced at a substantial pressure with steam at the proper vulcanizing temperature. This provided in the chamber the proper vulcanizing temperature and a pressure practically sufficient to prevent expansion of the mix under the influence of the gas-producing ingredients. The process is illustrated graphically in Fig. 5. After the mass was uniformly heated throughout and partially vulcanized, the pressure was reduced to permit expansion of the mass under the influence of the gas-forming ingredients. The proper vulcanizing temperature was maintained by the steam until vulcanization of the rubber sponge was complete.

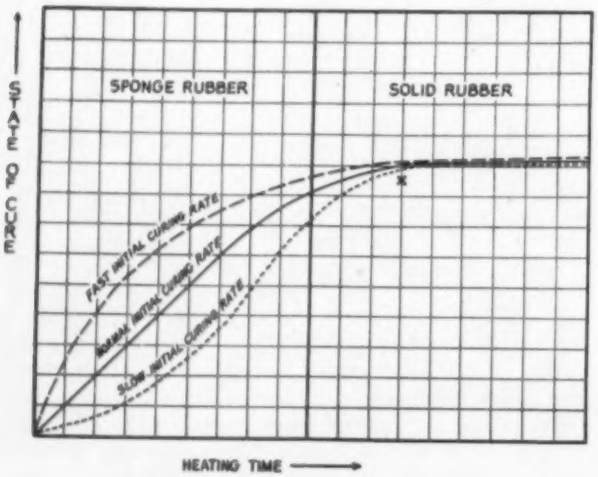


*FIG. 4—Theoretical Curing Curves.*

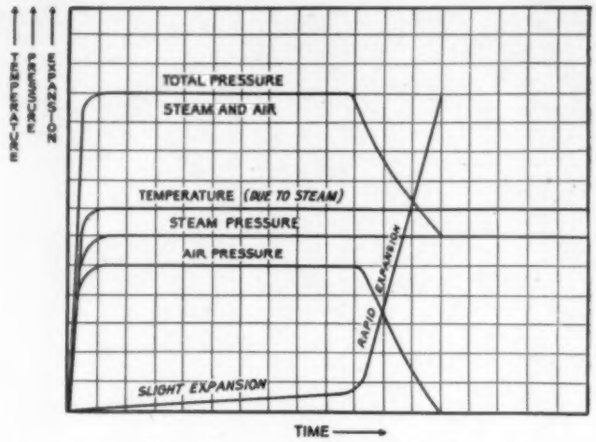


*FIG. 5—Lindemann Method.*

5. *Permeability of Rubbers to Various Gases Is Important:* This is important in the formation of cells in sponge rubbers but it is possibly more important in the field of Uni-cellular Rubbers. The soft Expanded Rubbers made from polymers which have the least permeability to the trapped gases, retain their usefulness for the longest period of time. The solubility of the gases in the polymers is important. In latex work the solubility of the gases in the liquid phase is also important.

REFERENCES


(1) USP 2,157,243.....Henry R. Minor
(2) USP 1,045,234.....Glen H. Willis & Benjamin F. Felix
(3) USP 1,777,945.....Frederick H. Untiedt
(4) USP 1,630,721.....Snelling
(5) BP 455,138.....Joseph Anton Talalay
(6) USP 1,038,950.....Fritz Pfleumer
USP 1,551,110.....Charles L. Marshall
USP 1,905,269.....Godfrey Price Denton
USP 2,086,513.....Dudley Roberts
(7) USP 1,745,657.....Herman Beckmann
(8) Multi-Pore - Shriver & Jordon....I.R.W., August, 1939
(9) USP 1,142,619.....Hugo P. Fannenstiel
(10) USP 1,951,618.....Herbert Lindemann


*(To Be Continued)*

EDITOR'S NOTE: In the concluding installment, to be published next month, the author discusses the present status of cellular rubbers.

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A new **mixer** intended for use in mixing explosive materials that might be set off by a single spark of electricity caused by static or contacts between metal parts of the operating equipment has been developed by Paul O. Abbe, Inc., Little Falls, N. J. All supports, gears and power units are placed in a separate room from the mixing chamber of the machine.

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Improved economy in current consumption is said to be the significant feature of the new **M-79 simplified four-speed reversing controller** for electric and gas-electric trucks manufactured by the Elwell-Parker Electric Co., Cleveland, Ohio. The new controller is installed on all of the company's low and high lift trucks in capacity up to 10,000 pounds.

# Abstracts of United States Patents on the Compounding and Use of Synthetic Rubber

By FREDERICK MARCHIONNA, M. S. Chem.

## Part XII

**Dales—U. S. Pat. 2,295,030—September 8, 1942. *Gelled Polychloroprene Latex.* (Assigned to E. I. du Pont de Nemours & Co., Wilmington, Del.).**

Polychloroprene latex containing soluble abietates or hydrogenated abietates used as dispersing agents, is gelled by contact with boric acid or esters thereof. The process is particularly adapted for forming articles by casting or dipping to form deposits of latex of about 0.025 in. thickness. In one example, a neoprene latex which contains polychloroprene (100), sulfur (0.25), sodium hydroxide (0.25), cyclohexanol (2), ammonium persulfate (0.25), sodium abietate (4), and water (100), is treated with 0.75 parts of 29% aqueous ammonium hydroxide, phenyl-beta-naphthylamine (0.45), and 1 to 3% aqueous sodium aldehydenaphthalene sulfonate (0.45). To 100 cc. of this there are added 20 cc. of 5% aqueous boric acid and the mixture poured in a mold. The mass gels in 1½ hours. This gel will shrink and exude serum but will preserve its shape. To the above latex (100) are added lithopone (10), zinc oxide (5), sulfur (2), phenyl-beta-naphthylamine (2), sodium dibutyl dithiocarbamate (0.8) and about 20 grs. of 5% boric acid added to 242 grs. of the compounded neoprene. The mixture is gelled in a mold as described, dried at room temperature and cured at 140°C. for 30 to 40 minutes. In another example, a form is dipped in a saturated solution of boric acid thickened with glue and then dipped in the neoprene latex containing the abietate to form a gelled deposit which may be treated with calcium chloride in alcohol to coagulate the gel, which is then dried and cured at 140°C. The form may be dipped first in boric acid (40) and ethyl alcohol (100). When this form is dipped in the neoprene latex a layer of gelled and coagulated latex is immediately formed. The polychloroprene latex may be stabilized with alkylolamines and the gelling agent may be triamyl, tributyl or similar alkyl borates, which may be dissolved and thickened with glue, starch, alginates, methyl cellulose, etc., with or without clay, bentonite, plaster of Paris, rosin, etc.

**Daniel et al—U. S. Pat. 2,296,427—September 22, 1942. *Polyolefine Dispersions.* (Assigned to Jasco, Inc., New York, N. Y.).**

Aqueous dispersions of polyolefines are produced by dispersing the polymer, in water or in a solvent, in the presence of water-soluble organic liquids, such as ethyl or methyl alcohol, glycol, glycerine, dioxane, etc., in small quantities. The process is applied with natural rubber, polybutenes, polybutadienes or copolymers thereof with acrylic or methacrylic acid esters. Thus, polyisobutylene or polybutadiene is dissolved in chlorobenzene, cyclohexane, toluene, etc., and a small amount of the dispersing agent, and water worked therein until the polymer is the medium to form a dispersion of the water-in-oil type in the form of a paste. By adding small quantities of the water-soluble organic solvent, a reversion of phase takes place to form an oil-in-water dispersion. In one example, a sodium butadiene rubber (300) in carbon tetrachloride (3240) is worked in a turbo mixer with water (1000) containing 0.5% casein in ammonia and potassium or ammonium oleate (12) to form the water-in-oil dispersion. By adding ethyl alcohol (40) to the composition, a reversion of phase is accomplished.

**Crater—U. S. Pat. 2,296,504—September 22, 1942. *Blasting Plug.* (Assigned to Hercules Powder Co., Wilmington, Del.).**

A blasting plug comprises an expansible plug of a synthetic rubber having a central bore into which may be driven a wooden wedge. The anterior end of the plug is fireproofed by coating with a fireproof material, or by molding the anterior end of the plug of a fireproof material. The expansible synthetic rubber plug is made in any known manner and its closed end fireproofed with a coating of a 50% sodium silicate solution (5) and asbestos powder (2.6); or zinc phosphate (17.5), diatomaceous earth (50), and 60% phosphoric acid (32.5); or with a magnesium oxychloride cement diluted with water (80) and asbestine powder (20). The plug may be molded in the form of a U-shaped cup from a mixture of plaster of Paris and asbestos fibre. When this mixture is in a mold the upper surface of the mold is primed with a solution of a synthetic rubber and the rubber-like expansible plug molded over this. No specific type of synthetic rubber is disclosed.

**Overstreet—U. S. Pat. 2,297,018—September 29, 1942. *Neoprene Sponge.* (Assigned to U. S. Rubber Co., New York, N. Y.).**

Cellular neoprene having open cell structure is made from closed cell neoprene rubber by subjecting cured polychloroprene sheets or slabs having closed cells to severe squeezing action while the blowing gas is within the cells, and compressing the gas to the point where it bursts the cells, thereby converting the closed cell neoprene rubber into an open cell structure. Thus, a composition containing polychloroprene (100), magnesium oxide (18), rosin (5), cottonseed oil (10), medium petroleum oil (15), sulfur (2), zinc oxide (10), Neozone D (2), and sodium hydrogen carbonate (20), is introduced into a confining mold where it is heated to partly cure the mass and decompose the carbonate and form gas bubbles within the mass without expanding it. The blown neoprene is then transferred into a larger mold of the size required in the final sponge and allowed to expand. It is next given a final cure by heating at higher temperature. After cooling to about 200°F., the sponged closed cell neoprene is removed from the mold and cooled to room temperature, thereby causing a shrinkage of the mass. By then passing this cellular slab between pressure rolls set about 0.2 inch apart, and brought gradually to 0.15 inch apart, the gas within the cells of the sponge is compressed, thereby causing the bursting of the cells to convert the closed cell neoprene sponge into an open cell structure.

**Badum—U. S. Pat. 2,297,194—September 29, 1942. *Cable Insulation.* (Vested in Alien Property Custodian).**

An ozone-resistant electrical insulating material for cables used in high tension lines or in Roetgen apparatus, neon tubes, etc., is prepared from a mixture of 10 to 50% polyvinyl chloride and 90 to 50% of an interpolymer of butadiene with acrylic nitrile. The cable may be insulated first with an ordinary natural rubber insulating layer. The ozone-resistant synthetic rubber may then be applied. It is considered preferable, however, to use an intermediate bonding layer from a mixture of natural rubber and the mixture of ozone-resistant synthetic rubber described.

**Gibbs—U. S. Pat. 2,298,881—October 13, 1942. *Preserving Rubber.* (Assigned to B. F. Goodrich Co.)**

The aging quality of natural and synthetic rubber is enhanced by incorporating therein a small quantity of a sulfone having the formula $R-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-R' = (OH)_2$ in which R is an organic radical with the free valance as a benzenoid ring, and includes dihydroxy diphenyl xylol or toluyl sulfone; dihydroxy phenyl chloro phenyl sulfone; etc. Thus, when 2.5 dihydroxy phenyl chloro phenyl sulfone and 2.5 dihydroxy phenyl toluyl sulfone are incorporated in small quantity in an interpolymer from 55 parts of butadiene and 45 parts of acrylic nitrile, the tensile strength and elongation of the synthetic rubber are preserved.

**Snyder—U. S. Pat. 2,299,509—October 20, 1942. *Plastic Material.* (Assigned to Liatex Corp., New York, N. Y.).**

A plastic and flexible product which is resistant to solvents, acids and alkalies, and is suitable for flooring, belting, etc., is composed of a natural gum from the Sapotaceae family (which includes the so-called Brazilian cow tree, Jelutong and Pontianak) and a sulfur dichlorohydrin plastic, as disclosed in U. S. Pat. 2,026,875, or the Thiokol described in U. S. Pat. 1,890,191. In one example, Masarandura gum obtained from the cow tree (5 to 100) is mixed with Thiokol to form a solid plastic which is easily worked into sheets. To this mixture may be added from 1 to 5 parts of ozokerite wax, in which case it is preferable to first mix the Thiokol and the wax at high temperature and then add the cow-tree gum to the hot mixture. In another example, Sapotaceae gum is mixed with Thiokol and a sulfur chlorhydrin plastic, as disclosed in Example 9 of U. S. Pat. 2,026,879, using from 0.5 to 50% of the gum and the other ingredients in a 20:5 or 5:20 ratio. The Thiokol is believed to react chemically with the plastic. In still another example, sulfur chlorhydrin plastic, obtained by refluxing 100 parts of dichlorohydrin with 150 parts of sodium sulfide and 128 parts of sulfur in water (300), is mixed with Pontianak gum and cow-tree gum, using 2% of Pontianak, 4% of cow-tree gum, and 94% of the sulfur chlorhydrin plastic.

**Denman—U. S. Pat. 2,299,805—October 27, 1942. *Packing Material.* (Assigned to Detroit Gasket and Manufacturing Co., Detroit, Mich.).**

A packing material consists of a highly composite compressed structure of a number of paper layers bonded together by means of a flexible and resilient cement binder of neoprene, Thiokol, etc. Thus, the paper layers may first be impregnated with a phenolaldehyde or urea-aldehyde resin and, after drying, coated on the faces to be joined with a solution cement of neoprene, Thiokol, etc. The required number of such coated sheets are superimposed and subjected to a pressure of about 500 lbs./sq. ft. to form a composite sheet of the required thickness. The exposed faces of this sheet may also be coated with a solution of neoprene or Thiokol to obtain a better sealing gasket. Blanks of the desired shape and size are then cut therefrom. It is important that the film of neoprene cement joining the various paper layers be of the order of 0.0015 inch, so as to prevent the cement from exuding between the layers when compressed.

**Spraragen—U. S. Pat. 2,299,955—October 27, 1942. *Weather Strip.* (Assigned to Bridgeport Fabrics, Inc., Bridgeport, Conn.).**

In the production of fibre weather strips a sponge rubber bead is covered with a woven fabric by means of a rubber or latex cement. The sponge rubber in bead form is passed through a bath of natural latex or an aqueous emulsion of neoprene, Buna rubber, etc., and then between squeeze rolls which force the rubber—natural or synthetic—into the sponge rubber core. This treated rubber sponge bead is then passed through an extruding device and the fabric cover is applied thereabout in a continuous manner. A relatively thick rubber sheath is then extruded thereabout so as to cause its adherence to the fabric and rubber sponge core.

**Earle—U. S. Pat. 2,300,352—October 27, 1942. *Neoprene Cements.***

A cheap neoprene cement is obtained by adding to an ordinary solution of polychloroprene a small quantity of rubber dissolved in a solvent which is a non-solvent for the neoprene. Benzol, toluol, xylol, trichlorethylene, etc., can be used as solvents for neoprene, while petroleum naphtha, such as Solvesso No. 1 (which is a non-solvent for neoprene), can be used for dissolving the natural rubber. The cement is made by dissolving 2 ounces of rubber in 14 ounces of the petroleum naphtha and mixing this solution with a neoprene solution consisting of 1.5 pounds of polychloroprene in 1 gallon of aromatic solvents. The resulting uniform cement consists of microscopical globules of naphtha solvent carrying the rubber particles dissolved therein dispersed uniformly in the neoprene solution. It is said that when this cement is applied to fabrics, leather, etc., it will penetrate the material to a greater or lesser extent and that during the penetration the minute globules of the non-solvent naphtha tend to block up the minute spaces in the porous material, thereby retarding the penetration action of the neoprene cement and increasing the thickness of the surface coating.

**Zaucker—U. S. Pat. 2,300,607—November 3, 1942. *Plasticized Polybutadienes.* (Vested in Alien Property Custodian, Washington, D. C.).**

Vulcanizable polybutadienes are plasticized by heating in the presence of oxygen and a stabilizer which prevents excessive oxidation and deterioration of the polymer by the oxygen. The stabilizer is selected from the group consisting of dimethylamine, phenyl amino naphthalene, tolylnaphthylamine, dinaphthylamine, naphthylenediamine, cresols, thymol, isobutyl phenol, iso-octyl or dodicyl phenol, cyclohexyl phenol, benzyl phenol, betanaphthol, dihydroxy diphenyl, tetrahydro-beta naphthol, etc. In one example, a 3% benzene solution of phenyl-beta-naphthylamine is added to an interpolymer from 75% butadiene and 25% styrene in which there has been incorporated 2% of a phenol. The mass is well mixed, crumbed, and treated with compressed air at a pressure of 3 atmospheres at 130° C. for 70 to 100 minutes to form a plastic polymer which will produce solutions of low viscosity.

**Schantz—U. S. Pat. 2,301,331—November 10, 1942. *Chewing Gum Base.* (Assigned to Hercules Powder Co., Wilmington, Del.).**

A chewing gum base consists of natural rubber, or a polychloroprene or polybutadiene synthetic rubber, mixed with hydrogenated rosin, hydrogenated abietic acid, hydrogenated pimaric acid, hydrogenated isomerized rosin, etc., with the rubber and the hydrogenated materials used in the ratio of 2 to 1:1 to 2.5. When synthetic rubber is the rubbery material, the chewing gum base is composed of hydrogenated rosin (12), synthetic rubber from chloroprene or a butadiene hydrocarbon (20), paraffine wax having an M.P. = 125° C. (100), cumar resin (3.6), beeswax (6), and water (3). The wax and the synthetic rubber are heated together slowly at 135° C. while being stirred until they are in homogeneous liquid form. The temperature is then raised to 145° or 150° C. and the other ingredients added, excepting the water. After cooling to about 95° to 100° C., the water is incorporated and the mixture becomes a suitable base for chewing gum.

**Tousley et al—U. S. Pat. 2,301,479—November 10, 1942. *Gas Masks.* (Assigned to B. F. Goodrich Co., Akron, Ohio.).**

In the production of outlet valves for gas masks for permitting exhaled gases to escape in the air, a form is used consisting of a planar member, which is semi-circular at one end and has straight edges at the other end defining the exit end of the valve, and a cylindrical member attached to the circular portion of the planar member at a right angle thereto, leaving an extension of the circular planar member. Such a form is dipped in natural latex or in a neoprene latex (as described in U. S. Pat. 1,996,090) to form a latex deposit of the thickness desired—about 1/32 inch. The deposited rubber is cut around the edge of the planar member section to divide the deposit into two portions. The edges of these two cut portions are coated with a cement around substantially the entire edge except at the feathered edges, and the two portions then pressed together at the coated edges to form two outlet ports which permit escape of exhaled air but prevent the inflow of air. The valve so formed may be attached to the gas mask in any convenient manner and cured.

**Bernstein et al—U. S. Pat. 2,301,998—November 17, 1942. *Oil Resistant Gaskets.* (Assigned to Victor Manufacturing & Gasket Co., Chicago, Ill.).**

A gasket is composed of a base of asbestos and wool felt treated with polychloroprene and natural rubber. Scrap gasket material may be used as the source of fibers. To produce such a gasket, asbestos fibers are disintegrated and dispersed in water to form a 2 to 6% suspension to which is added a binder and the aqueous slurry then worked into "paper" in a paper machine. A suitable mixture for making this "paper" consists of asbestos fibers (300), 50% polychloroprene latex (75), 60% natural latex (62.5), phenyl-beta-naphthylamine (1.5), zinc oxide (3.75), casein (0.16), sodium polyaryl sulfonate (0.05), and a black dye (1.4). In this formula 260 parts of the asbestos may be replaced with fiber from scrap gasket material, which is disintegrated in a hammer mill to ¼ to ⅛ inch size, and by using a correspondingly smaller quantity of binder. The fibers may consist of 200 parts of asbestos with 100 parts of wool felt. The gasket sheet thus formed is rendered resistant to oils, glycerine, antifreeze solution, etc., by treatment with a proofing coating which may be:

I—Ether type Thiokol (2) in ethylene dichloride (4) and toluol (4).

II—Polyvinyl chloride (14) in toluol (86).

III—Interpolymer of butadiene with acrylic nitrile or styrene (100), zinc oxide (5), sulfur (3), thermatomic black (10), and zinc dibutyl dithiocarbomate (1.5).

IV—Neoprene (100), dibutyl phthalate (10), coal tar (5), rosin (3), zinc oxide (5), channel black or soft black (10), stearic acid (1.5), benzothiazyl sulfide (1), dibutylamine (0.2), sulfur (1.3), antioxidant (2), in toluol (887.25).

V—Polybutadiene and resin (100), dibutyl phthalate (10), coal tar (5), rosin (3), zinc oxide (5), channel black (10), thermatomic black (30), stearic acid (1.5), accelerator (1), dibutylamine (0.2), and sulfur (1.3), in toluol (1,226).

**Nelles et al—U. S. Pat. 2,302,362—November 17, 1942. *Stable Halogenated Products.* (Vested in Alien Property Custodian, Washington, D. C.).**

Polychloroprene, chlorinated rubber, polyvinyl chloride, etc., are stabilized against decomposition by adding thereto from 0.5 to 10% of a N-acyl-ethylene-imine. This stabilizer may be added to chloroprene and the latter polymerized to form a stable polychloroprene. Thus, a solution of a polychloroprene in toluene containing 30% solids is admixed with 5% of the stabilizer, which may be N-benzene sulfonyl-ethylene-imine (obtained by treating benzene sulfonyl chloride with ethylene-imine), and heating the treated solution for 30 hours at 100° C. The stabilizer may also be a stearoyl ethylene-imine, N-benzoyl ethylene-imine, etc.

**Rockoff—U. S. Pat. 2,304,656—December 8, 1942. *Spinning Rolls.* (Assigned to Dayton Rubber Manufacturing Co., Dayton, Ohio).**

A textile roll particularly suitable for drafting fiber is provided with a resilient surface layer from a butadiene-acrylic nitrile interpolymer which is resistant to oils and greases and does not develop static charges. A suitable composition for such facing layer consists of butadiene-acrylic nitrile polymer (80 to 125), dibenzyl ether as plasticizer (10 to 25), cumar resin (6 to 12), zinc oxide (4 to 8), whiting (40 to 70), sulfur (1 to 2), and benzothiazyl disulfide (0.9 to 1.5). Clay, carbon black, etc., may be added. A butadiene-styrene interpolymer may be used as the synthetic rubber. The mixture may be molded into the proper size and shape, placed over the metal core of the roll, and vulcanized, after which it may be buffed, abraded, etc., to give to the roll surface the characteristics of calf skin.

**Hubbard—U. S. Pat. 2,305,164—December 15, 1942. *Printing Roll.* (Assigned to Ideal Roller & Manufacturing Co., Chicago, Ill.).**

The ordinary vulcanized oil composition used for surfacing printing rolls is improved by incorporating a quantity of neoprene, which will increase the resistance of the roll to the action of inks and oils. The quantity of neoprene used should be less than the amount of vulcanized oil. For the oil, it is preferable to use corn, soybean, acetylated castor oils, etc., which can be vulcanized with sulfur chloride, sulfur thiocyanate, dithiocyanogen, etc., after the oil has been admixed with the neoprene. In the production of the composition, Neoprene E (25) is compounded with zinc oxide (0.25), magnesium oxide (2.5), corn oil (32.5), and soybean oil (32.5), together with a previously heated mixture of 3.2 pounds of magnesium oxide and 100 pounds of linseed oil (7.23). This composition is thinned with benzol (44) and vulcanized by adding 4 cc. of sulfur chloride for each ounce of the mixture. It is stated that the presence of zinc oxide, which reacts with the HCl freed during the vulcanization action of the oil, accelerates the cure of the neoprene and that the magnesium oxide retards this accelerating effect. To make the printing roll, the foregoing composition is applied about a metal shell, previously coated with a wax, by centrifugal casting. The cast, cured cylindrical jacket is then removed from the mold by heating the metal mold at a temperature above the melting point of the wax coating. Preferably, a thick layer of soft, vulcanized oil is cast on the metal mold and the mixture then cast thereover. Printing blankets may also be made from the oil composition.

**Frolich—U. S. Pat. 2,305,412—December 15, 1942. *Tire Curing Bag.* (Assigned to Jasco, Inc., New York, N. Y.).**

The ordinary rubber curing bag used for curing pneumatic tires is replaced with one made from a synthetic rubber which is resistant to sulfur migration from the tire which is being vulcanized and to oxidation. Such synthetic rubber is from an interpolymer of butadiene, isoprene, etc., with isobutylene, using from 70 to 99.5% of isobutylene with 30 to 0.5% of a butadiene compound. In the example given the interpolymer is made by mixing butadiene 1.3 (20) and isobutylene (80) and polymerizing the mixture at —78° C. in the presence of aluminum chloride as a catalyst. This interpolymer (100) is compounded with Calcene (50), zinc oxide (50), stearic acid (3), sulfur (3), and Tuads (1). The interpolymer, zinc oxide, stearic acid, and sulfur are mixed in a Banbury mixer at about 140° C. for about 10 minutes. This mass is then transferred to a milling machine in which the rolls are kept cooled to about 70° C., and then compounded with the balance of the ingredients, and the uniform mixture either extruded into an inflating tube bag or formed into a sheet which is worked into the inflatable bag. The bag thus formed is cured at 150° to 250° C. from about 15 minutes to 3 hours and may be used in the manner customary for the use of similar rubber bags employed in the curing of pneumatic tires. Such a curing bag can be used many times without showing signs of deterioration.

**Perry—U. S. Pat. 2,305,488—December 15, 1942. *Asbestos Products.* (Assigned to Johns-Manville Corp., New York, N. Y.).**

A heat insulating material to be used for wrapping pipes to be insulated is composed of several layers of corrugated insulating asbestos layers provided with an outer layer of asbestos paper having a smooth surface. This asbestos layer is made by disintegrating asbestos by first milling and willowing and then shredding it in a hammer mill. These shredded fibers are dispersed in water to which is added a sizing of emulsified paraffine wax. This dispersion will contain preferably 2 to 5% of starch binder, 12 to 20% of sulfite wood pulp, 2 to 5% wax, and the remainder asbestos fibers. The paper from this mixture is coated with a casein paint which is applied by calendering it while the paper passes between a pressure roll of chilled iron and a supporting roll having a surface layer of neoprene. The calendered paper is then coated with a mixture containing natural latex or neoprene latex (2 to 4), casein (1), and titanium oxide or similar pigment (25 to 35), and diluted with 20 to 25 parts of water. About 2% of paraffine wax may be added to the foregoing to render the coating moisture-proof.

**Stone—U. S. Pat. 2,305,644—December 22, 1942. *Radio Shield.* (Assigned to Titeflex Metal Hose Co., Jersey City, N. J.).**

A radio shield consists of a tubular element of natural or synthetic rubber which is resistant to oils. This tubular shield is provided with a jacket of braided metal on the outside and a plurality of independent rings disposed longitudinally between the rubber tube and the metal jacket. A plurality of independent, separate rings also are disposed longitudinally within the rubber tube, these being staggered in relation to the ring between the metal jacket and the rubber tube. The latter rings are of electrical insulating material, preferably Bakelite. The patent does not specify the nature of the synthetic rubber that may be used.

**Bentz et al—U. S. Pat. 2,305,804—December 22, 1942. *Composite Flooring.* (Vested in Alien Property Custodian, Washington, D. C.).**

An acid resistant structure for floors, walls, etc., is composed of a base covered with successive layers of a composition containing hydraulic cement with natural or synthetic rubber as a binder followed with a layer of a polyvinyl resin and a surface layer of ceramic material. In a specific example employing synthetic rubber, a concrete floor is covered with a layer 1 cm. thick of a Thiokol composition containing 60% aqueous condensation of dichlorodiethyl ether with sodium polysulfide (150), zinc oxide (10), accelerator (3), 10% aqueous casein (10), quartz powder (250), and Portland cement (50). After drying, a solution cement of polyisobutylene in benzol is applied thereover and a layer 1 mm. thick of a polyethylene or polyisobutylene plastic is joined thereto. The joints between these laminations are smoothed out and sealed by passing a hot roller thereover, after which a surface layer of ceramic tile is attached thereto by means of a suitable cement.

**Taylor—U. S. Pat. 2,305,910—December 22, 1942. *Drafting Method.***

In the process of drawing on transparent paper, an accumulation of dirt or pencil mark—called "scum"—is produced on the surface of the paper which creates objectionable dark areas. The patent deals with means for eliminating this scum accumulation on the drawing paper. This is accomplished by distributing over the surface of the paper a quantity of natural or neoprene rubber in the form of powder, preferably admixed with a small quantity (about 10%) of lubricating powder, such as talc, whiting, fuller's earth, bentonite, etc., which will function as a lubricant to reduce the friction between the rubber powder particles and the draftsman's instruments. The powdered rubber is preferably colored pink, yellow or green to contrast with the white and black of the drawing. The rubber is ground or powdered into fine particles having rough and irregular surfaces and admixed with about 10% of talc or other lubricant powder and the mixture screened to pass through a 30-mesh but be retained on a 200-mesh sieve.

**NOTE ON FOREIGN PATENTS**

**Practically all of the patents originally issued and/or assigned to companies or individuals in enemy or enemy-occupied countries have been vested in the Alien Property Custodian of the United States. Anyone interested in using or exploiting any of the synthetic rubber patents abstracted in this series by Frederick Marchionna is urged to communicate his interest to the Office of the Alien Property Custodian, Washington, D. C. This applies only to those patents issued and/or assigned to companies or individuals in enemy or enemy-occupied countries, which may be determined by the names and addresses shown in connection with each abstract.**

## ADDENDA

**Hepp—U. S. Pat. 1,932,104—October 24, 1933. *Abrasive Articles.* (Assigned to Synthetic Rubber Abrasives, Inc., Hamburg, N. Y.).**

Abrasive products, such as grinding and polishing discs, wheels, etc., are obtained by mixing finely divided abrasive grains with an incompletely polymerized chloroprene, either in semi-fluid or plastic state. The relative proportions of the binder and abrasive particles are adjusted so as to form a mass having the consistency of concrete, and the quantity of polychloroprene may even exceed the quantity of abrasive particles. During the mixing operation, the polychloroprene will wet thoroughly the surfaces of the abrasive grains, thereby effecting a better bond of the abrasive. Carbon black, reinforcing fibers, etc., also may be included in the mass. The mixture is shaped in a mold or pressed in presses to form articles of the required size and shape. Consolidation of the article is effected by heat and pressure, preferably in the presence of oxygen, to complete the polymerization of the chloroprene and cure the article. It is stated that the pressure has a very important effect upon the degree of hardness of the final product; hence, by regulating the pressure during cure, products of varying degrees of hardness will be obtained.

**Zerk—U. S. Pat. 1,959,259—May 15, 1934. *Sealing Oscillating Joints.***

The oscillating or rocking bearing joints, such as tie rod, drag link, foot pedal, and spring hanger joints, spring shackles, etc., which are filled with oily or waxy lubricants, are sealed with an oil- and grease-resistant flexible seal of a polychloroprene. This neoprene seal is preferably in the form of a molded closure, of frusto-conical shape, having walls which increase progressively in thickness from its larger to its smaller end. Each of the end portions of the seal is adapted to extend into a channel encircling one of the bearing members of the joint so as to engage the member in a constrictive manner. The two end portions of the neoprene seal are oscillable with the joint device which they engage. These end portions are joined by an intermediate portion having a wall increasing in thickness from the end portion of larger diameter toward the end of smaller diameter.

*(To Be Continued)*

# STATEX-93

...for low hysteresis and dynamic adhesion in

# GR-S

A COLUMBIAN COLLOID

DISTRIBUTOR

MANUFACTURER

# STATEX-93

## DYNAMIC ADHESION

Ever since tread rubber has been toughened with carbon the stepping down of compounds from tread to lower carcass has been recognized as an essential to sound tire construction. Continued adhesion of the several tire elements throughout a normal period of service is contingent on good engineering which includes good compounding. The term "dynamic adhesion" is suggested as descriptive of the result accomplished by a compounding balance which serves to maintain adhesion of the several parts under dynamic strain.

We suggest study of Statex 93 as an HMF Carbon offering the useful combination of good tensile and modulus with low hysteresis. The extent to which these properties are maintained at elevated temperatures is not the least of the advantages of Statex 93.

**FURNEX**
The High Resilience Carbon

**MICRONEX**
For 30 years—The Standard Reinforcing Carbon

COLUMBIAN COLLOIDS

BINNEY & SMITH CO. · COLUMBIAN CARBON CO.
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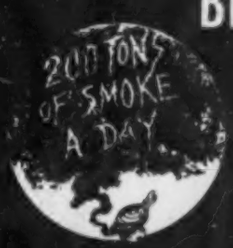


*Hortonspheres in the Buna S area at the Sarnia, Ontario, synthetic rubber plant.*

# Synthetic Rubber at Sarnia

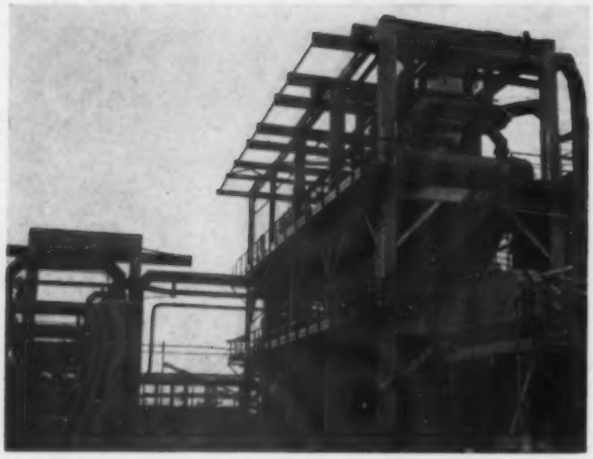
BUILT on the site of an old Indian reservation one mile from Sarnia, Ontario, the synthetic rubber plant built by the Polymer Corporation, Ltd., a Crown company, is now in production with an estimated annual output of 34,000 long tons of Buna S and 4,000 long tons of Butyl Rubber. The first sod at the plant was turned on August 10, 1942, and thirteen months later, using styrene made at the plant and butadiene imported from the United States, commercial production of Buna S was begun at half capacity. Few plants have turned out synthetic rubber more speedily. An official press tour of the completed plant was made on January 10.

The Sarnia plant has no counterpart anywhere in the world. It produces not only Buna S and Butyl Rubber, but also its own styrene, butadiene, and isobutylene, as well as its own steam and electric power. It is virtually a self-contained village, since it harbors ten large "factories," each as large and as complex as a good-size munitions plant. Bordering its 22 streets, it boasts its own hospital, fire hall, general store, bowling alley, post office, police department, cafeteria, and dining halls, one of which is also used as a movie hall. It even has its own ball park.

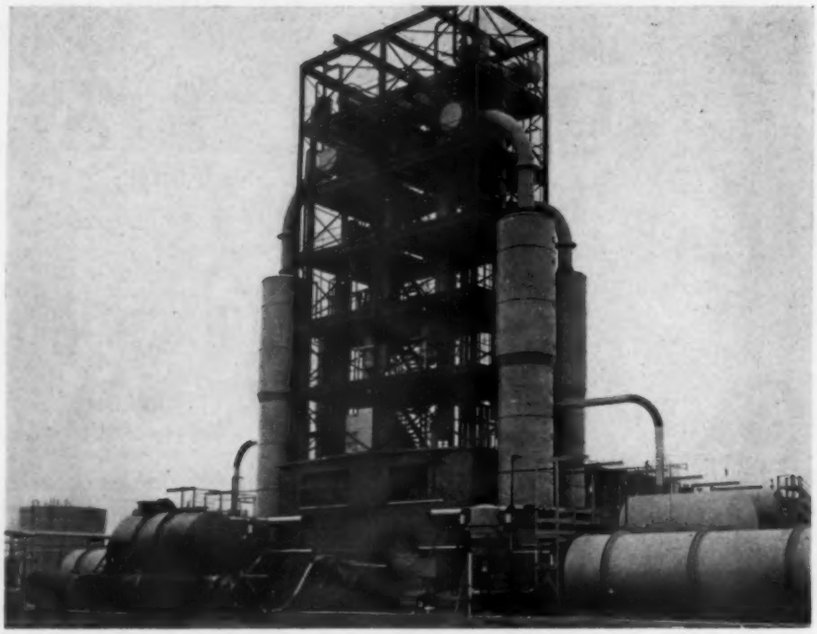
To make its annual output of approximately 40,000 longs tons of synthetic rubber, the Sarnia plant requires annually 500,000 tons of coal, more than 45 billion imperial gallons of water, 19 million imperial gallons of light end petroleum, 2½ billion cubic feet of petroleum gas, 2¼ million imperial gallons of benzol, and enough brine to contain 3,500 long tons of salt. All this in addition to huge quantities of soap, acids and other raw materials necessary for the production of synthetic rubber.

The ten "factories" which comprise the Sarnia plant are: (1) Supersensoid Cracking Coil; (2) Light Ends Recovery Unit; (3) Isobutylene Extraction Unit; (4) Butylene Concentration Unit; (5) Butadiene Unit; (6) Styrene Unit; (7) Buna S Unit; (8) Butyl Unit; (9) Steam and Power Plant; (10) Pumping Station. Some of these units are illustrated on the two following pages. In addition to these production units, the plant boasts a well-equipped, modern laboratory housed in its own building, a large, modern warehouse, fully-equipped machine shops, and an administration building. Some 1600 employees are required to keep the plant in operation.

The various units of the Sarnia plant are operated by different organizations. The supersensoid cracking coil (which is an ingenious adaptation of the more-or-less standard refinery thermal cracking unit), and the light ends recovery, isobutylene extraction, butylene concentration, and butadiene units are operated by the St. Clair Processing Corp., Ltd., a subsidiary of Imperial Oil, Ltd. This organization also operates the Butyl Rubber unit, the steam and power plant, and the pumping station. The styrene unit is operated by Dow Chemical of Canada, Ltd., while the Buna S unit is run by Canadian Synthetic Rubber, Ltd., a corporation formed by the Canadian subsidiaries of Goodyear, Firestone, U. S. Rubber (Dominion Rubber) and Goodrich.



In this dehydrogenation building, one of two at Sarnia, normal butenes are mixed with high temperature steam and passed over a catalyst, thus removing the hydrogen and producing butadiene. The impure butadiene is purified in another building by selective solvent absorption. The rated capacity of the butadiene unit is 30,000 tons a year. It will, however, probably exceed its capacity.



The styrene unit is seen at the right. In the first operation ethyl-benzene is produced. This is cracked in a second building and the styrene purified in the building shown. Unconverted ethyl-benzene is returned for further cracking. Some toluol raw material for high explosives is obtained as a by-product. Although styrene may be used as a plastic, all of it made at Sarnia is being used for Buna S.

*All photos by National Film Board, Ltd.*

This is the fractionating structure of the isobutylene extraction unit at the Polymer Corporation plant. Isobutylene and isoprene are combined to form Butyl Rubber. The Butyl Rubber unit at the plant is geared to produce 4,000 long tons per year, an amount believed sufficient to meet all Canadian requirements. The drying of Butyl Rubber is handled much the same way as is that for Buna S.

## SYNTHETIC RUBBER AT SARNIA

Fifteen compressors, powered by 8-cylinder 300 h.p. refinery fuel gas engines, are housed in this compressor building of the Butyl Rubber unit. The various machines develop pressures from up to 250 pounds to up to 450 pounds. Hydrocarbon gases are dropped to as low as —150° F. The refrigeration is part of the process by which isobutylene is polymerized into Butyl Rubber.

Here is one of the steps in the production of Buna S at Sarnia. At this stage, the rubber is referred to as filter cake. Fresh from the washing and initial drying machine, the rubbery cakes are conveyed on a natural rubber belt to the tearing rolls where they are "minced" into millions of tiny pieces. From that point, the rubber goes through a drier (see below), is automatically weighed, baled and shipped, to processing plants.

*All photos by National Film Board, Ltd.*

The continuous roller-drier seen here is one of four maintained at Sarnia. Each unit is 65 feet long, 25 feet high, and 10 feet wide. In the drying units, the conveyor belt carries the rubber forth, back, and then forth again, on three levels. It travels very slowly, and at the end of the conveyor drops into an automatic weighing device which feeds approximately 75 pounds to the baler.

# Editorials.....

## Post-War Synthetics

AS the war in Europe heads toward its climax and as attack after attack is launched on Japanese-held islands in the Pacific, presaging a reasonably early major assault on Japan itself, discussion mounts on the post-war outlook of synthetic rubber. Production of synthetic rubber under the government over-all program is now approaching 60,000 tons monthly, and as new butadiene sources are completed, especially those based on petroleum, the monthly output will increase steadily until the full quota is hit.

There are two schools of thought on the post-war synthetic rubber situation. One argues, as previously reported, that only sufficient synthetic rubber capacity should be maintained in this country to guarantee military protection in the future; the other that full synthetic facilities as constructed under the emergency program be maintained, in addition to privately-owned and operated plants. John L. Collyer, president of the B. F. Goodrich Co., is one leader who opposes scrapping any of the plants and advocates free post-war competition between synthetic and natural rubber to keep their prices low and stable, thus encouraging greater use of both.

Mr. Collyer has been consistent in denying that the synthetic rubber of tomorrow (based on today's product) will require economic protection behind a tariff wall to compete with the natural product. He is firm in his belief that an improved synthetic rubber is in the offing, one more equal to natural rubber in most of its properties and superior to it in many. Based on a continuous survey conducted by Goodrich, Mr. Collyer has estimated that world consumption for several years after the cessation of all hostilities will approach 2,800,000 long tons annually, and that such a demand will call for all-out production of both natural and synthetic rubber. For this reason, among others, he is positive that domestic synthetic rubber production needs no tariff protection or even agreements between producers.

There is little doubt that improved synthetic rubber is in the offing. The research laboratories of both U. S. Rubber and Goodyear have announced new types of synthetic rubbers in recent months. Admittedly, these are products which have some good and some bad qualities. It takes time to improve the good and eliminate the bad, but slowly improvements are incorporated until a better synthetic results. In the meantime work continues on improving methods of milling and processing the GR-S produced in government-owned plants, with considerable success reported. Sooner or later a completely satisfactory tackifying agent will be developed to eliminate one current major problem.

Efforts to change polymerization methods in the production of GR-S, and thus produce an improved polymer, also continue. The recent completion of the pilot plant at Akron, which will be operated by the University of Akron under the supervision of the Rubber Reserve Co., lends encouragement to this phase of the current situation. Coordination of research efforts at the pilot plant, as well as of the laboratory in which evaluation tests will be run, has been placed in the capable hands of Dr. James W. Schade, former director of research for Goodrich.

From all of these efforts a better synthetic rubber is bound to emanate. A synthetic rubber which has most of the properties of natural rubber and is superior to it in some respects, and which can be produced and sold at reasonable cost, has little to fear from the natural product in the post-war era.

## Need For Crude Rubber

THE necessity of continuing efforts to secure crude rubber was recently emphasized by the Combined Raw Materials Board, as reported elsewhere in this issue. The report was issued because of the lack of appreciation in some quarters concerning our need for natural rubber due to the progress achieved to date by the synthetic rubber program. It made the point that unless more natural rubber than is now in sight is forthcoming the situation in 1945 will be considerably aggravated. This is a situation best appreciated by rubber manufacturers who still need some crude rubber to combine with the synthetics in the production of heavy-duty tires and other products. Despite this appreciation, there are some who still feel we are paying too much for rubber from Latin America, especially since we have offered a premium to Brazil. These are no days for short-sighted policy.

# CURRENT NEWS OF THE MONTH

## CRUDE RUBBER USE FURTHER RESTRICTED AS SYNTHETIC CONVERSION PLAN PROCEEDS

FURTHER revisions in the rubber regulations, specifically affecting milking machine inflations, hard rubber products, industrial protective clothing, cements for non-leather shoes, and loans of synthetic rubber among manufacturers, were announced by the Office of the Rubber Director on February 15. The latest changes are incorporated in Revised Appendix III of Rubber Order R-1, as Amended February 1, 1944. The latest regulation continues to reflect stricter curtailment of the use of crude rubber and easing up of the use of general purpose synthetics. Additional orders along the same general lines may be expected in the near future, particularly with respect to crude rubber, the stockpile of which is not too satisfactory.

The new regulations provided by Revised Appendix III include the following:

*Milking Machine Inflations:* The conversion of milking machine inflations from crude to synthetic rubber is postponed from February 1 to April 1, 1944. The reason for the postponement is that manufacturers of these products were not able to meet the first conversion date without loss of production. The postponement permits them to continue to use minimum quantities of crude rubber until April 1.

*Hard Rubber Products:* Crude rubber may no longer be used in the manufacture of certain hard rubber products used in handling corrosive chemicals and explosives. Previously, the quantity of crude rubber permitted in the manufacture of such products as bottles, fittings and pistons varied from 30 to 60%. The new order puts such products completely on a synthetic basis. The crude rubber content of hand-made component parts of machinery for the manufacture of rayon, corrosive chemicals and explosives is reduced from 30% to 10%.

*Industrial Protective Clothing:* Manufacturers of compounds for proofing and seaming industrial protective clothing are now permitted to consume Buna S in addition to reclaimed rubber without specific authorization. Such proofing compounds were previously limited to reclaimed rubber, and it was necessary for a manufacturer to obtain special authorization before using general purpose synthetics.

*Cements for Non-Leather Shoes:* Rubber cements containing general purpose synthetics are now permitted for non-leather shoes (such as wedgies) to the same extent that such cements have been allowed for leather shoes. The regulation governing use of such cements in the manufacture of leather shoes was put into force on February 4. The effect of the new amendment is to permit a manufacturer of non-leather shoes to use synthetic-type cements in his operations to the same extent that such cements were previously authorized for manufacture of leather shoes. Use of neoprene cements in non-leather shoes is confined to the same operations as have been previously provided in the case of leather shoes. Extension of the regulation governing cements has been made necessary by the fact that production of shoes from materials other than leather is substantial and requires the use of cements made from synthetic rubber.

*Loans of Synthetic Rubber:* Manufacturers of rubber products are now permitted to make temporary loans of general purpose synthetics to other manufacturers without specific authorization. Full records of such loan transactions must be kept by both the persons lending and the persons borrowing. The transactions must be reported to the Office of the Rubber Director.

Additional orders issued during the past several weeks affecting various branches of the industry, including price controls, follow:

### RUBBER-COATED FABRICS

A method of establishing ceiling prices on products containing a substitute synthetic rubber material which is more expensive than the one which they have been using was provided to manufacturers of rubber-coated fabrics by OPA on February 28. The provision was contained in Order No. 25 under M.P.R. No. 478 (Coated and Combined Fabrics). The Office of Rubber Director recently ordered manufacturers to discontinue the use of neoprene in the production of these fabrics.

Where Buna N is substituted for GR-M or Neoprene GN in the manufacture of these products, manufacturers are allowed, under the method provided, to add to the former maximum prices an amount not exceeding the increase in synthetic rubber materials cost resulting from the substitution. Previously, such manufacturers were required to file individual applications for price approval for each specific item. Where substitutions of other materials are made, ceilings will be established as formerly under the coated and combined fabrics regulation.

Numerous products are covered by the action, all of them being essential military or civilian items. The effect of the action on the ultimate consumer will vary considerably, depending upon the article involved.

### DRUG SUNDRIES

Ceilings for four groups of flat goods in the Victory line of rubber drug sundries have been increased three cents per item under the terms of Amendment 15 to M.P.R. No. 300 (Maximum Manufacturers' Prices for Rubber Drug Sundries) and Amendment 10 to M.P.R. No. 301 (Retail and Wholesale Prices for Rubber Drug Sundries). The new prices were effective March 3.

Manufacturers were granted this increase in their dollars-and-cents ceilings to compensate them for added costs caused by the substitution of synthetic rubber for natural rubber in the commodities involved. Wholesalers and retailers were likewise granted a three-cent increase in their specific ceilings to enable them to pass on to the consumer the higher cost of these items.

The increases are for the Victory Line consumer grades 1 and 2 hot water bottles, fountain syringes, and combination syringes, and for molded ice caps. These products will continue in the list of items known as the Victory Line, on which ceilings were established in February, 1943.

The increases have been granted to avoid hardship on the industry and also to facilitate continued production of these Victory Line items. Data collected by OPA showed that a substantial portion of the industry could not cover its costs at the former ceilings because of higher costs involved in the use of synthetic rubber in the making of these items. Since October, 1943, the industry has been largely on a synthetic rubber basis.

### RUBBER FOOTWEAR

In order to further define the types of canvas rubber footwear which are authorized for manufacture by the Office of the Rubber Director, OPA is-

sued Amendment 9 to M.P.R. No. 132 (Certain Rubber Footwear) on February 22. The new amendment sets forth maximum prices for four types of canvas rubber footwear, including the type known as "training shoes, backed upper, molded soles." The words "molded soles" were inadvertently omitted from the heading of the latter type in Table II of the regulation.

One of the types of canvas rubber footwear previously authorized was changed in Rubber Order R-1, as Amended January 12, 1944. The new amendment to M.P.R. No. 132 changes type "untrimmed circular vamp oxford" to "untrimmed oxford" to conform to this change. No substantial changes in the quality, composition and manufacturing costs of canvas rubber footwear was made by this amendment.

Previously, on February 18, OPA established new dollar-and-cent ceiling prices for waterproofed rubber footwear —rubbers, arctics, gaiters and rubber boots—by issuing a revision of the retail and wholesale regulation for certain rubber footwear. This footwear has been produced in recent months with an increasing substitution of synthetic for crude rubber and with reduced amounts of reclaimed rubber as compared with the Victory Line footwear manufactured immediately after the entrance of the United States into the war.

The revised regulation — R. M. P. R. 229 (Retail and Wholesale Prices for Certain Rubber Footwear)—provides that if a retailer is able to buy at a lower net price because of increased purchases, he must redetermine the price class to which he belongs. He must then take the ceilings of his new price class. This requirement has been added so that any savings through quantity purchases will be passed on to the consumer. The former regulation is also simplified by the revision.

Ceilings established on January 26, 1944, for canvas-topped rubber-soled shoes of vulcanized construction are incorporated in the revised regulation as well.

Because of demonstrated increased costs for this new type of rubber footwear, manufacturers and wholesalers were permitted to increase their maximum prices on January 26, 1944, by approximately 9 per cent over the Victory Line ceilings. The new retail ceilings reflect the actual dollar-and-cents increase in cost to the retailer and represent an average increase of 6½ per cent over the maximum dollar-and-cent prices allowed on the Victory Line footwear. For these higher prices, the public will receive rubber footwear that will more nearly approach the wearing quality of pre-Pearl Harbor footwear than did the Victory Line products, OPA said.

Five groups of ceilings are provided for different classes of retailers, depending on the discounts which they receive from manufacturers and wholesalers. A simplified table is provided, enabling a retailer quickly to determine his ceiling on any type of waterproof rubber footwear. On rubbers the ceilings range from 28 cents a pair for mail order sellers of women's molded footholds to $2.78 a pair for Class 1 sellers of men's two-buckle work rubbers.

### *Boots and Work Shoes*

Under the terms of Amendment No. 7 to Ration Order 6A (Men's Rubber Boots and Rubber Work Shoes), certificates need not be collected when rubber footwear is transferred by an agency of the U. S. Government to the Procurement Division of the Treasury Department, if the footwear is acquired by the latter for transfer. It also enables the Procurement Division to dispose of the footwear in the same way that an establishment is permitted to transfer footwear under the terms of the regulation. This amendment became effective February 24.

Amendment No. 8 to the same ration order, issued on February 28, covers new provisions relating to the importation of rubber footwear into the United States. Any person may import such footwear if he first gives to the Collector of Customs at the point of entry certificates for the number of pairs of each type which he wants to have delivered or released to him by the Collector. Under certain conditions the Collector of Customs may release imported rubber footwear without certificates.

## GOVERNMENT WILL SPEND $30,000,000 TO IMPROVE SYNTHETIC UNITS

According to an announcement made by Rubber Director Dewey on February 17, $30,000,000 worth of improvements are to be made in plants producing synthetic rubber and its raw materials during the current year. Highest priorities have been granted to all of this scheduled production and installation.

It must be understood that these projects are in no sense an expansion of the synthetic rubber program but will simply put into effect certain minor additions and changes designed to bring about more efficient operation of some of the rubber units.

Of the total amount to be expended, $3,000,000 will be allocated to butadiene-from-alcohol facilities and $10,000,000 to butadiene-from-petroleum projects. Styrene plants will receive $3,000,000 and $10,000,000 will be spent on the improvement of copolymer plants. An additional $3,000,000 is being allocated to Butyl Rubber facilities and the balance—$1,000,000—will be spent on miscellaneous improvements to various units.

### *Consumption of Neoprene*

As reported in our previous issue, the consumption of GR-M, Neoprene GN and Neoprene Latex was placed under quota restriction early in February. Since that time Quota Directive 1-N has been issued to each consumer of neoprene specifying the amounts which he may consume during the months of February and March. On February 12th, the Office of the Rubber Director issued a special list of permissible products for which neoprene could be used and the following additional restrictions relating to the three types of neoprene placed under quota directive:

(1) After February 19, 1944, no consumer shall use GR-M, Neoprene GN or Neoprene Latex to fill government or civilian orders in the manufacture of any products except those on the permitted list without specific authorization by the Office of the Rubber Director.

(2) Quotas assigned by Directive 1-N for consumption during March, 1944, should be reviewed by each consumer on the basis of the permitted list. If neoprene consumption will be less than the quota assigned, the Office of the Rubber Director must be advised immediately as to the extent of any reduction.

Manufacturers having neoprene requirements for April were instructed to write to the ORD specifying the amounts required by item (divided between government and civilian orders) as set forth on the permitted list. This information was to have been submitted to the ORD on or before March 1.

For those manufacturers who have government orders for products manufactured from neoprene which are not on the permitted list, it was suggested that they advise the Procurement Agency that under the new regulations they are no longer permitted to use neoprene to fill orders or contracts on hand. In the event that the Procurement Agency is unwilling to accept an available synthetic substitute, it was further suggested that the Agency in question be referred to the ORD for additional information.

### *Butadiene Activities*

According to reliable reports, further expansion of the synthetic rubber program awaits the increase of butadiene facilities. The past month has witnessed several developments in this direction which indicate that the butadiene portion of the over-all program is rapidly nearing its completion.

On February 23, the butadiene-from-petroleum plant operated by the Neches Butane Products Company was formally dedicated at Port Neches, Texas. More than 3,500 persons, including officials and leaders of the petroleum and rubber industries, attended the dedication ceremonies. Rubber Director Dewey was the chief speaker.

The Neches Butane plant is the world's largest plant devoted to the production of butadiene from petroleum bases. The company was formed by five oil firms—Gulf, Texas, Atlantic, Pure Oil and So-

cony-Vacuum—and operates the huge butadiene project without profit.

On February 18, the Union Carbide and Carbon Corporation, which operates the large butadiene unit at Institute, West Virginia, announced that a record production of butadiene at that plant has made it one of the world's largest butadiene production units. The plant has produced butadiene above its rated capacity during its first full year of operation despite the fact that the last of its four units to go into full operation did not begin producing butadiene until early last Summer. The plant has a rated capacity of 80,000 tons a year but at the present time it is delivering butadiene at a rate of over 100,000 tons a year.

The report issued by Union Carbide pointed out the fact that over eight-tenths of a short ton of butadiene is needed to make about one long ton of Buna S and consequently the delivery of butadiene from the Institute plant alone during the past year has added more than 90,000 long tons of synthetic rubber to the nation's supply. It was also stated that over 75% of the nation's total production of butadiene in 1943 came from the alcohol process developed and engineered by the Carbide & Carbon Chemicals Corp., a unit of Union Carbide.

A statement issued by the Butadiene Division of the Koppers United Company on March 2 indicated that Kobuta, the name applied to the butadiene plant operated by the company at Beaver, Penna., produced more butadiene during the month of January than has been produced by any other American plant in any single month. This production was more than 150% of the plant's rated capacity of 80,000 tons of butadiene per year. Kobuta utilizes the alcohol process developed by Carbide & Carbon and is one of three plants using this process. The 200-acre plant went into full production late in 1943.

Further encouragement to the butadiene situation is found in the report that the grain alcohol plant operated by the Farm Crops Processing Corporation in Omaha, Nebraska, second largest plant of its kind in the world, went into production on February 21. The plant is owned by the Defense Plants Corporation and is leased to the Nebraska concern. It is estimated that the plant will require approximately 7,000,000 bushels of grain annually and that it will process 20,000 bushels daily, using 45% corn, a like proportion of wheat and 10% barley malt.

### *New Investigation Launched*

Investigation of the production of alcohol for use in making butadiene as part of the over-all synthetic rubber program is being resumed by the Senate Agricultural Sub-Committee headed by Senator Guy M. Gillette. In announcing resumption of the investigation on March 2, Senator Gillette charged that President Roosevelt's veto of the Rubber Bill he sponsored last year plus the recommendations made by the Baruch Rubber Committee, most of which were adopted and put into effect, have hampered development of synthetic rubber.

The Senator stated that in his opinion if the legislation had been carried out last year "there is little doubt but that we would have now all the rubber we need from synthetic manufacture, together with expansion of natural rubber production, to take care of civilian and military needs largely."

The vetoed legislation, it will be recalled, was written primarily by former Senator George Norris and the late Senator Charles McNary. It called for the creation of an independent rubber agency pledged to greater production of butadiene from alcohol.

The renewed investigation, according to Senator Gillette, will endeavor "to produce the facts in the synthetic rubber situation."

### *Goodyear Pump House Damaged*

Production of Buna S at the government- owned plant operated by Goodyear in Akron was temporarily halted on February 18 as a result of an explosion in one of two chemical pump houses on the site of the plant. Nine persons were injured in the explosion but fortunately no deaths were reported. The blast knocked people out of bed and broke windows and dishes in stores and homes for nearly a mile around the synthetic plant.

Akron firemen, answering a third alarm, fought for more than two hours to keep the flames from the huge butadiene and styrene storage tanks. The butadiene burning in the pump house represented a terrific hazard for several hours but was finally brought under control without spreading to other units of the plant. Cause of the explosion was not determined although sabotage was ruled out by investigators. At this writing partial production has been restored.

## NEW RUBBER PACTS TO BE SIGNED WITH PERU, COLOMBIA AND ECUADOR

According to a statement by Douglas H. Allen, president of the Rubber Development Corporation, agreements similar to the supplementary treaty that was made last month with Brazil, under which the United States will pay a premium of 33⅓% above previously fixed prices for rubber, will shortly be concluded with Peru, Colombia and Ecuador. These new negotiations were predicted last month.

The negotiations now under way with the three rubber-producing countries mentioned above are, like the Brazilian pact, intended to implement Rubber Development's gradual withdrawal from the Amazon rubber industry. Payment of the premium for rubber from these three countries is dependent on the provision that the government agency finds increases in production costs to have been great enough to warrant the payment of the premium and that such payment would probably result in increased shipments of crude rubber.

### *Text of Brazil Agreement*

The full text of the supplementary agreement with Brazil, which has now been formalized by an exchange of notes between the American Embassy and the Brazilian Foreign Office in Rio de Janeiro, was released by Mr. Allen on March 2. In making public this text, Mr. Allen pointed out that the problem faced by Brazil and the United States at the time the basic rubber agreement of March, 1942, was signed, was one of reviving and rapidly expanding the moribund wild rubber industry particularly in the Amazon area and that to accomplish this purpose it was necessary to provide supplies, equipment and staple food stuffs in large volume and to assure distribution to the rubber gatherers through an increase in river and other transportation facilities.

Because this task has been successfully accomplished, Mr. Allen stated, it is now possible for Rubber Development to relinquish certain emergency activities, responsibility for which it had been requested to assume in the critical period of 1942 and early 1943 when the flow of supply and foodstuffs upon which rubber production depends was seriously threatened by a shortage of shipping space, aggravated by the submarine menace. It was made clear that Rubber Development will continue to cooperate actively during the period of the agreement with the Government of Brazil to assure the maximum possible production of wild rubber.

Under the terms of the supplementary agreement, Brazil specifically agrees among other things to assume all future development expenditures with respect to road building activities and labor subsidies in Southern Mato Grosso. Brazil also agrees to a termination at the earliest practicable date of the following specific commitments and obligations of the Rubber Development Corporation:

(1) Any obligations to supply staple foodstuffs or to maintain fixed prices therefor under the agreement dated April 3, 1943, between Rubber Development Corporation and S.A.V.A. (Superintendencia de Abastecimento do Vale Amazonico).

(2) Any obligation to make available at less than cost tappers' supplies and equipment under the aforesaid agreement between Rubber Development Corporation and S.A.V.A.

(3) Any obligation under the proposed agreement dated July 16, 1943, between Rubber Development Corporation and

S.N.A.P.P. (Servicio de Navegacao da Amazonia e Administracao do Porto do Para) to provide coal at less than cost or to pay higher than established freight rates on freight of Rubber Development Corporation moved by S.N.A.P.P. on vessels other than those owned by Rubber Development Corporation or furnished by Rubber Development Corporation to S.N.A.P.P.

### *Statement by Combined Board*

The following statement on the position of the United Nations in respect to supplies of natural rubber was made by the Combined Raw Materials Board on February 25:

The considerable progress achieved in the American synthetic rubber program has led to a certain lack of appreciation concerning the United Nations' need for natural rubber. Since this misunderstanding threatens to hamper the United Nations in securing the largest possible amount of natural rubber from the few producing areas still under our control, the Board wishes to emphasize in the strongest possible terms our urgent need for crude rubber.

Synthetic rubber has not dispensed with the need for natural rubber. All experience to date indicates that certain products, such as surgical goods, truck and bus tires, and a variety of essential war items, still require varying percentages of natural rubber. Our small supplies of natural rubber are steadily being depleted as we continue to mix natural rubber with the synthetic product. Technical experts on both sides of the Atlantic have made large strides in learning how to use synthetic rubber in place of crude. It is essential that we continue our efforts to increase the proportions of synthetic rubber in tires and all other products in which some natural rubber still is being employed.

Very careful estimates have been made of the quantities and types of tires and rubber products required to be produced for military and essential civilian use during the coming year. The authorities in both the United Kingdom and the United States are reducing to the minimum the amount of natural rubber which the manufacturers will be permitted to use in meeting this program. Nevertheless, the amount of crude rubber which must be released if essential needs are to be met will dangerously deplete our natural rubber reserves and leave our stock position at the end of the year at below the minimum set in the Baruch report. The situation in 1945 will be further aggravated unless more natural rubber than is now in sight is forthcoming.

In other words, despite the great success to date with the synthetic program and the need for bringing it to maximum production at the earliest possible date, we are consuming natural rubber at a considerably greater rate than we are receiving it from the few sources still available to us. Even at the lowest rate to which we can compress natural rubber consumption, supply and requirements of natural rubber will not be in balance. It is, therefore, essential that the greatest possible economy in the use of natural rubber continue to be maintained and that every step be taken to increase the amount of natural rubber available to the United Nations.

### *Launch Guayule Investigation*

A full scale investigation into the government-sponsored program for the development of guayule as a domestic source of rubber has been launched by a special sub-committee of the House Agriculture Committee. The sub-committee is headed by Representative Poage (Dem., Texas). It will also check on the feasibility of developing other domestic rubber sources including saghyz rubber and goldenrod. The sub-committee wants to determine "once and for all how much rubber this country can expect from these plants." A fight to restore a substantial appropriation for production of guayule is being led by the General Tire and Rubber Company.

Mexico is completing new facilities designed to boost substantially production from guayule for export to the United States. Two new guayule milling plants are about to go into production. A third is expected to begin operations early this year, according to the Rubber Development Corporation.

The new plants are expected to increase Mexico's capacity to produce guayule rubber to 12,000 tons in 1944. This would compare with an estimated 8,000 tons in 1943 with five processing units.

Mexico's production of guayule depends on milling facilities. The shrub grows wild over large sections of northern-central Mexico. From collection centers throughout this area the shrubs are forwarded to the milling plants where processing must get under way before the shrubs dry.

### *Other Crude Developments*

In a report received from Chungking made by a noted Chinese evangelist, who recently escaped from Singapore by way of Thailand, the extreme shortage of shipping has made Malaya a useless asset to the Japanese. Huge stocks of rubber and tin are lying in idle stock piles because the Japs do not have the ships to transport them. Wooden sailing boats are being built at Singapore, Penang and other points in the hope that they may be able to be used to carry some degree of trade between Malaya and Japan proper.

Although this informant stated that the Japanese are unable to manufacture tires in Malaya, the Tokio radio in a broadcast recently reported by U. S. Government monitors, claimed that a factory for the manufacture of tires and tubes had just been completed in Singapore. The statement was made that the factory was built to achieve self-sufficiency in tires for Japanese-occupied Malaya.

Unknown sources of rubber are reported to have been discovered in the interior of Surinam, the Netherlands colony on the northeast coast of South America. The new rubber resources were reported by Dr. Dirk C. Geyskes, who has just returned from an exploration trip of more than seven months. Penetrating further into the unmapped jungle of Dutch Guiana than any previous white expedition, Dr. Geyskes found both the "hevea guianensis" and "hevea pauciflora." The latter is the source of the so-called "white rubber."

The Geyskes' party also discovered and mapped an entirely unknown high mountain peak southwest of the Wilhelmina mountains. The area prospected for rubber lay north of the Wilhelmina mountains and the upper Coppename River; trails extending as far as seventeen miles were hacked into the mountain wilderness.

The United Fruit Company is planning a nursery of 75,000 rubber trees in an area of approximately 500 acres in Guatemala. Seeds obtained from the Ford plantations in Brazil and the Firestone plantations in Liberia will be used. The plantings will be supervised by the U. S. Department of Agriculture. Nursery beds were prepared a year ago and are reported to show excellent possibilities.

## NEW PROCEDURE FOR ALLOCATION AND DISTRIBUTION OF CERTAIN TIRES

A comprehensive procedure for the allocation and distribution of truck-bus tires, tractor-implement tires, and industrial tires, on a quarterly basis, was announced by the Office of the Rubber Director on February 16.

The new regulation governs the allocation of tires among official Claimant Agencies and provides for the control of tire production and shipment schedules to ensure maximum planned output by the rubber industry. The allotment procedure has the effect of applying the principles of WPB's Controlled Materials Plan to the production and distribution of the type tires mentioned. Tires of the passenger car type are not covered by the plan, nor does the procedure in any way affect the method by which civilian consumers will procure replacement tires of the critical types involved.

In the past, the Rubber Director has issued allotments of certain quantities of tires to such Claimant Agencies as the War Department, Navy Department, Office of Defense Transportation, and War Food Administration. However, the Rubber Director has not until now estab-

lished procedures for controlling the actual procurement by each Claimant Agency of such allotted tires from the rubber industry.

For example, equipment manufacturers producing rubber-tired vehicles for the Army have in the past been covered by a War Department tire-allotment, but each equipment manufacturer has proceeded independently to obtain tires for the vehicles he was producing for the Army. Now, under the new allotment plan, the War Department, as a typical Claimant Agency, will have the direct responsibility of carrying out the administration of its allotment, under a standardized procedure, with the Office of the Rubber Director serving as coordinator and clearing house. Confusion and competition among manufacturers of rubber-tired equipment will thus be minimized.

The new plan outlines in detail the steps which manufacturers of rubber-tired equipment must take in order to get tires. On or before the first day of the month preceding the quarter covered by a given allotment, each Claimant Agency must determine the number of tires which may be shipped to each of its vehicle manufacturers during the quarterly period, and must authorize each vehicle manufacturer in writing to accept delivery of a specified number of tires.

No vehicle manufacturer will be allowed to accept delivery of tires for his production of vehicles or equipment unless he has been specifically authorized to accept such delivery by the Claimant Agency. Each vehicle manufacturer will be required to certify to his tire supplier that he has been authorized by the appropriate Claimant Agency to accept delivery. This must be done 15 days before the quarter begins. A standard form on which such certifications are to be submitted is included in the text of the plan.

The ORD explained that the new procedure in no way limits the functions now carried out by the various Claimant Agencies. To the contrary, the plan gives the Claimant Agencies an expanded authority and responsibility over the details of procurement and shipment of tires allotted to them by the Office of the Rubber Director.

The new tire allotment plan has been added to the rubber regulations in the form of Appendix IV to Rubber Order R-1. It becomes operative for the second quarter of 1944.

### *Quotas Increased Slightly*

The March rationing quotas of tires and tubes released by OPA on March 1 show slight increases over February in the passenger and truck tire quotas, but a decrease in the farm tractor and implement category. The new passenger tire quota is set at 691,025, an increase of 45,975 over the February quota, while the used tire quota remains at 645,050.

The March truck and bus tire quota was divided into two size categories for the first time. Boards will have separate quotas for truck tires of sizes 7.50 or smaller and for those of 8.25 or larger. Boards will indicate on each tire certificate issued the size tire which the applicant is to buy. The separate truck tire quotas were provided so that truck operators needing large size tires would not be penalized by an exhausted quota resulting from a large demand for small size tires.

The new truck and bus quota is about 18,000 tires larger than the February quota of 267,917. However, it is 13,000 less than the quota of a year ago. The new truck tube quota of 230,503 is about the same as last month's quota. While the quota for new truck tires remains at a low level, OPA pointed out that ration certificates for used tires may be given out by local boards to essential truck operators without quota limitation.

The March farm tire quota has also been broken into two groups for the first time. The groups are: (1) Rear Tractor Tires and (2) Front Tractor and Implement Tires. The total of the two groups is 5,500 tires less than the February quota. Because of the acute shortage of rear wheel tractor tires in many parts of the country, a sharp cut has been made in the number of these tires for which boards may issue certificates in March. The quota for rear wheel tractor tires is 8,280 and for front tractor and implement tires 13,800.

Tractor and implement tube quotas were also lowered for March to 18,400 from the February figure of 23,000.

### *Amendments to Ration Order*

Three additional amendments to Ration Order 1A (Tires and Tubes) have been issued since our last report, as follows:

*Amendment No. 69,* issued February 15 and effective February 19, provides for an increase in wholesalers' inventories of new passenger tires and tubes to facilitate the flow of the limited stocks of these tires and tubes from wholesale to retail to consumer channels. Systems of increasing allotments and determining allotments are set up in the amendment.

*Amendment No. 70,* issued and effective March 1, revokes the provision in the regulations making combination retail-wholesale dealers whose wholesale net dollar sales of tires and tubes totaled $100,000 or more in 1941 eligible for increased allotments of new passenger tires and tubes. As a result of this amendment, only dealers exclusively engaged in wholesaling will be eligible for increased inventories of such tires and tubes.

*Amendment No. 71,* issued March 13 and effective March 17, provides that only when the present rear-wheel tractor tire is worn beyond the recapping stage may ration certificates be issued by local rationing boards to purchase new rear-wheel tractor tires. Under the amendment, operators of delivery trucks used by a medical or dental laboratory, by a dry cleaner, or for transporting laundry, drugs, medicinal supplies or essential foods are now eligible for new "obsolete" tires.

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### Habirshaw Wire Expanding

According to present plans, the Habirshaw Wire & Cable Division of the Phelps Dodge Copper Products Corp., located in Yonkers, N. Y., will shortly take over the $1,000,000 County Center in White Plains, N. Y., which was opened in 1930 for music festivals, operas, concerts, and other cultural activities. Under the terms of a lease being arranged, Westchester County would lease the center to Phelps Dodge for $60,000 a year for the manufacture of copper cables and other insulated products, with the provision that the center would be restored to its prewar condition at the end of hostilities.

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### Geon Polyvinyl Resins

The Chemical Division of the B. F. Goodrich Co. has selected the name "Geon" for a group of polyvinyl resins which it has developed and is now offering to industrial users. The name was taken from the root word geo (the earth) because the basic raw materials from which the polymers are derived have mineral origin. Two of the resins —Geon 202 and 203—are said to be entirely new vinyl chloride-vinylidene chloride polymers.

### New Aero Accelerator

Aero AC 165, a new self-activating accelerator for GR-S, has been developed and introduced by the American Cyanamid & Chemical Corporation, New York 20, N. Y. The new accelerator is said to disperse readily and to have low scorching tendencies among other safe processing qualities. It is also reported to produce vulcanizates with good physical properties, including better cut growth resistance and improved aging characteristics. A technical bulletin on the new material has been prepared and is available on request to the manufacturer.

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Goodyear now has in operation an expanded schedule of production of tractor and other farm-use tires, according to P. W. Litchfield, chairman of Goodyear's board, who gives as the reason for this shift of emphasis the fact that more food is needed from American farms. "In 1932, when Goodyear first began to manufacture pneumatic tires for farm tractor use," says Mr. Litchfield, " there were steel-wheeled tractors on only 845,000 farms. Now, 1,700,000 farms are using tractors and most of them have pneumatic tires."

# THIRTEEN TECHNICAL PAPERS ON SYNTHETIC RUBBER ARE PRESENTED AT SPECIAL SYMPOSIUM HELD IN CINCINNATI UNDER ASTM AUSPICES

More than 600 technologists from the rubber and other industries attended the special symposium on "The Applications of Synthetic Rubbers," held at the Netherlands Plaza Hotel in Cincinnati on March 2 under the auspices of the American Society for Testing Materials. A.S.T.M. Committee Week was the occasion for the symposium, which featured thirteen technical and semi-technical papers.

Arthur W. Carpenter, manager of testing laboratories for the B. F. Goodrich Co., who is chairman of Committee D-11 on Rubber Products, was chairman of the Symposium Committee which arranged for the presentation of papers. The technical chairmen at the symposium, split into morning and afternoon sessions, were J. H. Ingmanson, vice-president of the Whitney Blake Co., and Simon Collier, of the Johns-Manville Corp.

### *Purpose of Symposium*

The papers had as their principal purpose the dissemination of information which would evaluate the use of various synthetic rubbers in product fields. The first five papers, presented at the morning session, were basic in concept, that is, not considering specific applications, whereas the eight papers comprising the second session dealt with specific appplications, including tires and tubes, hose and belting, molded products, cellular rubbers, hard rubber products, insulated wire and cable, footwear and adhesives. It was announced that all of the papers will be available for distribution in booklet form in the near future, and those desiring copies should communicate with A.S.T.M. headquarters at 260 So. Broad St., Philadelphia 2, Penna.

The five so-called "basic" papers and their authors included the following: *Origin and Development of Synthetic Rubbers,* Harry L. Fisher (U. S. Industrial Chemicals); *Physical Tests of Synthetic Rubber Products,* Leslie V. Cooper (Firestone); *Physical Properties of Synthetic Rubbers,* John M. Ball (Vanderbilt); *Specifications for Synthetic Rubber Compounds,* M. J. DeFrance (Goodyear); and *Processing Characteristics of Synthetic Rubbers and Their Use in Extruded Products,* A. E. Juve (Goodrich).

The subject matter of each of these basic papers is more-or-less clearly defined by the titles of the papers themselves. The paper by Mr. Ball was of particular interest since it was based on data supplied by a number of rubber manufacturers and suppliers, in addition to that compiled by the Vanderbilt laboratory, and contained a good deal of unpublished data. The data from all of these sources was critically examined and the cumulative results furnished in table form.

The paper by Dr. Fisher was an excellent review of the background of synthetic rubber from the experiments of Wohler in 1828 up to present-day achievements, while the talk on physical testing by Mr. Cooper indicated the necessity of devising adequate tests for the synthetics whether such tests are new ones or modifications of those applied to natural rubber. The specifications for synthetic rubber compounds discussed by Mr. DeFrance were largely those evaluated by standardized A.S.T.M. procedures.

### *Papers on Specific Uses*

Titles and authors of the eight papers in the afternoon session which were concerned with the specific applications of the synthetic rubbers were as follows: *Synthetic Rubber Tires and Inner Tubes,* P. M. Torrance (Firestone); *Hose and Belting Made from Synthetic Rubber,* W. L. White (Manhattan Rubber); *Use of Synthetic Rubbers in Molded Products,* Merle Sanger (General Tire); *Synthetic Cellular Rubbers,* Louis P. Gould (Inland Manufacturing Div., General Motors); *Hard Rubber Products from Synthetics,* Walter H. Juve; *Use of Synthetic Rubbers for Insulated Wire and Cable,* R. A. Schatzel (General Cable); *Use of Synthetic Rubber in Footwear,* Stanton Glover (U. S. Rubber); and *Synthetic Rubber Adhesives,* Fred J. Wehmer (Minnesota Mining).

Here, again, the titles are indicative of the subjects covered, but a few comments follow: Mr. Juve indicated that 90% of permissable hard rubber products have been converted to synthetics; Mr. Torrance presented a composite picture of the current opinions of the technologists of the tire industry regarding the synthetics; Mr. Glover intimated that the footwear industry is making GR-S footwear and allied products which compare very favorably with the natural rubber products, if styling and cost are overlooked; Mr. Sanger stated that molded items are being produced which are almost equal in quality to those made from natural rubber; and Dr. Schatzel pointed out that although GR-S, primarily designed for tire use, presented special problems to the insulated wire manufacturers, such manufacturers were producing fairly satisfactory products.

### *Address Made by Collyer*

On the evening of the symposium, A.S.T.M. members and committee members were guests of the Technical Societies Council of Cincinnati which, following a buffet supper, held its annual meeting at Taft Auditorium, featuring an address by John L. Collyer, president of the B. F. Goodrich Co., on "America's Rubber Outlook." Dr. Waldo L. Semon, director of research for Goodrich, also addressed the meeting.

In his talk, Mr. Collyer declared that the future national security of America demands that the huge new synthetic rubber industry be preserved after the war and made an integral part of our national economy, adding that "we have learned through bitter experience that we cannot afford to face the future without an adequate insurance policy in rubber."

Mr. Collyer also repeated his previous assertions that, regardless of economic factors, as much rubber as the long-range planning of our armed forces might specify must be kept in production. He set this figure as between 150,000 and 200,000 tons of general purpose synthetic. He also urged as much additional production as can be justified "through the free play of economic forces in meeting our post-war rubber needs, which we estimate may total 900,000 tons a year, or nearly 50 per cent greater than consumption in 1940."

In concluding his address, Mr. Collyer emphasized that only by continued research and actual volume production will the cost of synthetic rubber approach more nearly the production cost of natural rubber.

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The fact that 11,000 persons—more than half as many as the total Akron enrollment of the company—are now either 10- or 20-year veterans of Goodrich was revealed by John L. Collyer, president, at the concern's semi-annual service pin presentation in Akron recently. Among the employees honored at that time were five who have completed 40 years of unbroken service with the company, including T. B. Tomkinson, controller, and Winnie McCafferty, who is believed to have the longest service record of any woman employed in the Akron rubber industry.

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To meet unexpected demands for its glossary giving pronunciations and meanings of synthetic rubber words, the Hycar Chemical Co., Akron, has had this information printed in an 8-page pamphlet, measuring 5½ x 8¼ inches in size. The booklet is designed to help business, industrial and sales executives and their associates in discussion of synthetic rubber and is not intended as a scientific treatise.

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The lives of propeller shafts on minesweepers, tugs and similarly war-vital seacraft can be increased about 10 times by the use of synthetic rubber propeller shaft coverings which protect the shafts from corrosive action of salty ocean water, according to Goodyear. The synthetic rubber is applied to a propeller shaft in a sheet about three-sixteenths of an inch thick after the shaft has been shot-blasted and has received a preliminary coat of cement.

## SEVERAL NEW DEVELOPMENTS ARE ANNOUNCED BY GOODYEAR

Several new developments, some of which may have far-reaching effects in the industry, have been announced in recent weeks by the Goodyear Tire & Rubber Co., Akron. These include two new types of synthetic rubbers, improved methods of milling and processing GR-S, two new accelerators, a new and simple method of bonding wood to metal, and a new packaging material.

The first new synthetic rubber, according to Dr. L. B. Sebrell, director of research, gives promise of being a superior type for the manufacture of tires. It is a butadiene copolymer, but with a new chemical substitute for styrene. This new synthetic has the energy resilience and the crack growth resistance of natural rubber, being superior to GR-S in these respects, but it has not yet been developed to a point where it will show high tensile strength at high temperatures. The styrene-substituted chemical, it was said, is expensive to make.

The second new synthetic rubber is designed to duplicate the chemical activity of natural rubber. Called a "chemically-active rubber," it can be successfully chlorinated. One of the components of this new type synthetic is now being manufactured in large quantities in this country and while the production of the other major constituent is small, it could probably be stepped up if necessary.

### *New Processing Development*

Referring to the improved processing and milling development, Dr. Sebrell stated that while GR-S under ordinary conditions will not easily enter into chemical reaction and while ordinary samples of it, for example, cannot be readily chlorinated, the Goodyear Research Laboratory has succeeded in producing special samples of GR-S which can be chlorinated. He added that considerable amount of research is necessary before the methods of handling GR-S are brought to their maximum efficiency. Little was revealed on the two new accelerators developed by Goodyear other than that they are intended for use with GR-S and that they are both anilineamide derivatives.

The new method for bonding wood to metal is made possible by the creation of a new type of rubber-like adhesive, called Pliobond. By means of this new adhesive, it is possible to cement a layer of plywood only one forty-eighth of an inch in thickness to a metal surface. A metal sheet of any thickness covered with a layer of any desired wood can then be handled in the same fashion as the sheet alone. In use, Pliobond is spread on the metal sheet, the layer of wood is placed over it, and the "sandwich" is then put in a press under moderate pressure and heat for 15 minutes.

The new packaging material has both current and postwar possibilities, according to Dr. R. P. Dinsmore, vice-president in charge of research and development. Called "V-Film," it utilizes a base of plastic resin and may be used as an alternative in some of the packaging applications of Pliofilm. A major advantage of V-Film is the fact that it can be produced on equipment installed originally for the manufacture of the prewar product. Although not the equal of Pliofilm in some respects for moisture-proof packaging, the new material is said to be superior to Pliofilm in tear resistance and several other factors.

Another recent development announced by Goodyear is a new anti-ice "boot" for propeller blades which employs synthetic rubber compounded to conduct electricity. The "boot" for each blade weighs about a pound. Its core is a thin sheet of synthetic rubber which conducts electricity and which is bordered for the entire length of each edge by thin wire conductors. On the inside of each "boot" —the portion cemented to a propeller's leading edge—is a reinforcing layer of fabric and another thin layer of synthetic rubber. The exterior is a heavier layer of synthetic rubber to provide the necessary resistance to abrasives.

## Coming Events

**Mar. 24** R. I. Rubber Club, Crown Hotel, Providence, R. I.

**Mar. 28-30.** Tenth Annual Chemurgic Conference, St. Louis, Mo.

**Mar. 31.** New York Rubber Group, Building Trades Club, N. Y. C.

**Apr. 3-5.** A.S.M.E., Spring Meeting, Birmingham, Alabama.

**Apr. 3-7.** A.C.S., 107th Meeting, Cleveland, Ohio.

**Apr. 4.** Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Cal.

**Apr. 14.** Boston Rubber Group, Hotel Statler, Boston, Mass.

**Apr. 14.** Montreal Rubber Group, Queens Hotel, Montreal, Canada.

**Apr. 21.** Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

**Apr. 26-28.** Rubber Division, A.C.S., Spring Meeting, Hotel Commodore, New York City.

**June 26-30.** A.S.T.M., 47th Annual Meeting, Waldorf Astoria, N. Y. C.

## Milex Producing Camelback

The production of camelback was recently started by the Milex Corporation in a portion of the old Thiokol factory in Yardville, N. J. The company was formerly located in Woodstown, N. J., and acted both as a tire distributor and as tire rebuilding and repair specialists. Althought additional products may be added sometime in the future, present production is restricted solely to camelback, according to S. C. Compher, manager of the corporation.

## SEVERAL NEW ACTIONS TAKEN BY A.S.T.M. COMMITTEE D-11

Numerous actions on new and revised standards were taken by Committee D-11 on Rubber Products of the American Society for Testing Materials during meetings held at Cincinnati, Ohio, from February 28 through March 4—A.S.T.M. 1944 Committee Week. These included the following:

Important revisions in the tests for automotive hydraulic brake hose (D-571) and for automotive air brake and vacuum brake hose (D-622) will permit their use for hose made from synthetic rubbers.

Consideration is being given to changes in the oil immersion test for rubber belting covered with other tests in A.S.T.M. D-378.

### *Wire Specifications Reviewed*

In the field of insulated wire and cable, the 11 A.S.T.M. specifications were discussed in detail. Since future developments may make changes necessary for wire and cable insulation, the specifications will continue in their present tentative status.

Specifications for cellular rubber products and methods of test for their evaluation have been completed. These are the first standards to be issued by A.S.T.M. covering these products so extensively used in war applications. The work is being expanded to cover sponge rubbers, latex foam, and expanded rubbers.

In the work of widespread interest on low-temperature tests, the new Methods of Test for Hardness and Modulus at Low Temperatures will be issued. Also completed were recommended practices for pre-treatment in cold or low-temperature testing.

Additional procedures for inclusion in the Tests of Rubber-Coated Fabrics (D-751) will cover hydrostatic resistance by the Suter method and hydrogen permeability by the Cambridge permeameter. Since rubbing, or abrasion, is a very important characteristic of proofed fabrics, a round-robin series of tests using different types of apparatus is under way and may result in detailed abrasion test procedures.

### *Recommend Tentative Tests*

Existing tentative specifications and tests which will be recommended for adoption as formal A.S.T.M. standards cover tear resistance of vulcanized rubber (D-624), resistance to light checking and cracking (D-518) and sampling and testing rubber latex (D-640).

Revisions have been developed, many to be incorporated this year, in standards covering the following: indentation of rubber (D-676); compression-deflection characteristics (D-575); compression set (D-395); changes in properties of material in liquids (D-471); and tests of hard rubber products (D-530). In this latter field a series of round-robin tests are expected to develop pertinent data.

## TALK ON HEAT RESISTANCE FEATURES CHICAGO MEETING

A talk on the "Compounding of GR-S for Heat Resistance," by John G. Hendricks of the Research Laboratory of the National Lead Co., featured the meeting of the Chicago Rubber Group, held in the Morrison Hotel, Chicago, on February 4. The non-technical entertainment of the evening was provided by Lt. Henry Penfield of the Aviation Cadets Selection Board who showed confidential movies of the Navy, thoroughly enjoyed by members and guests.

In presenting his talk, Mr. Hendricks stated that most GR-S vulcanizates are characterized by a pronounced tendency to undergo continuous and irreversible changes in physical properties when subjected to heat and that in distinction to the heat deterioration of natural rubber oxidation seems to be of little importance in the heat aging of GR-S. The presence of free or loosely bound sulfur, he said, seems to play a most prominent role, while accelerator activity also appears to be a factor in the changes brought about by heat. These observations tend to indicate that either after-vulcanization or continued polymerization or cyclization or more likely a combination of the two is in large measure responsible for the lack of stability of GR-S vulcanizates toward heat.

Continuing his talk, Mr. Hendricks stated that the deterioration of GR-S compounds at elevated temperatures can be greatly reduced by the use of low sulfur levels. Low sulfur used in conjunction with a combination of about 1.5% of litharge and 1.0% of a thiazole-type accelerator gives vulcanizates greatly superior in heat stability. Modulus tends to remain steady for a given cure and to assume a plateau over a wide range of cures. Retention of elongation and tear resistance are correspondingly improved. Hardness and dynamic properties tend to retain their original values.

Under these compounding conditions, the author said, zinc oxide may be used as a modifying agent. At normal sulfur levels, zinc oxide contributes heavily toward heat deterioration. With low sulfur levels, however, zinc oxide content may be utilized to modify modulus, hardness and dynamic properties to some extent without impairing heat stability. (EDITOR'S NOTE: Mr. Hendrick's paper is reproduced in full in this issue.)

The Chicago Rubber Group was also scheduled to hold a meeting on March 10th at which S. M. Martin, Jr., of the Thiokol Corporation, was to talk on the new Thiokol S. T. A complete report of this meeting will be made in the next issue.

### Philadelphia Insulated Wire Co.

For 1943: Net profit of $16,594, equal to $1.21 a share, which compares with net profit of $32,905, or $2.38 a share, reported for the previous year of 1942.

### Powell with International Plastic

Charles S. Powell

Charles S. Powell, who has served as chief chemist for the Rubber Corporation of America, Brooklyn, N. Y., for the past year, has left that organization to join the International Plastic Corporation, Morristown, N. J., as chief chemist and laboratory director. Born in New York City in April, 1906, Mr. Powell received his B.S. in Chemical Engineering from Yale University in 1928. He spent seven years with the Firestone Tire & Rubber Co. at Akron, mainly in the research compounding division, and in 1936 joined the Revertex Corporation of America where his work covered both technical service and development detail in latex adhesives and compounds. Shortly after Revertex acquired a financial interest in the Rubber Corporation of America he joined that organization as chief chemist. He will reside in Morristown.

### Hall Introduces SPDX-G

A new free-flowing type of SPDX has been announced by the C. P. Hall Co., Akron, Ohio. Known as SPDX-G, the new material is formed when SPDX is agitated under suitable conditions with a selected mineral oil. It consists of small soft granules or pellets and in this form is dustless, handles easily, mills readily into the batch, and has good dispersion. It contains 75% of active SPDX and on a dry weight basis is said to have exactly the same accelerating value as that material. In the future, SPDX will be furnished in granule form only under the name of SPDX-G. The new accelerator is manufactured by Chemico, Inc., and is distributed exclusively by the C. P. Hall Company.

## LOS ANGELES RUBBER GROUP HEARS TALK BY HISTORIAN

Dr. Wallace Sterling, professor of history at the California Institute of Technology, Pasadena, was the principal speaker at the regular monthly meeting of the Los Angeles Rubber Group, held at the Mayfair Hotel in Los Angeles on March 7. Well versed in his subject, Dr. Sterling treated the 120 members and guests present to a discourse on the character and problems of Russia, and concluded his talk with some thoughts on postwar Germany.

Another feature of the program was the showing of color moving pictures of a canoe trip taken by T. Kirk Hill (Kirkhill Rubber) and Ed Royal (H. M. Royal, Inc.) down the Rogue River in Oregon. Musical entertainment was furnished by the Zenith Sisters, popular vocalists, and Jan Jacobson, noted pianist, who rendered several of his own compositions.

A report made by the treasurer indicated that the group's funds were in the best shape in the history of the group, while the membership committee reported considerable activity. A few other minor reports were made at the meeting.

Several prizes were donated for distribution, including a sterling silver carving set and bon-bon dish by John Hoerger (Schrader's), a $15 gift order by Charles Churchill (B. E. Dougherty), three $5 books of war stamps by Bob Abbott (C. P. Hall), and cigarette servers and address books by Bert Biheller (Muehlstein).

These went to Paul Wineman (Goodrich), Charles Churchill (Dougherty), Claus Vonder Reith (Sierra Rubber), Al Pickard (Braun Corp.), Bill Davis (D. & D. Decorating), Gilbert Dohm (U. S. Industrial Alcohol), Tony Reznick (Firestone), H. Libkind (Wagner Electric), Lota Jung (U. S. Rubber), R. W. Herman (Sierra Rubber), and Henry Huneke (Sierra Rubber).

The next meeting of the group is scheduled for Tuesday, April 4, also at the Hotel Mayfair in Los Angeles.

### Galey Addresses Montreal Group

Dr. W. Galley, of the National Research Council, Ottawa, Canada, was the principal speaker at the meeting of the Rubber & Plastics Division, Montreal Section, Society of Chemical Industry, held at McGill University, Montreal, on February 11. Discussing "Some New Developments in Plastics," Dr. Galley divided the plastics into four classes: molding, laminating, coating and adhesives, and spoke briefly on new developments in each of these classes. He also covered the elastomer type of synthetic, such as the Norepol types, as well as some of the newer ones under development which give as high as 3000 pounds per square inch tensile and 600% elongation.

## ASTM ADOPTS NEW METHODS FOR TESTING COATED FABRICS

Recommendations of new test methods for evaluating various properties of rubber-coated fabrics, now so widely used in many products relating to the war endeavor, were recently approved by Committee E-10 on Standards of the American Society for Testing Materials. They are covered by ASTM designation D-751-43-T.

These new methods for evaluating properties of rubber-coated fabrics which are made by applying either natural rubber compounds or synthetic elastomers processed on rubber machinery resulted from concentrated work by Committee D-11 on Rubber Products through a new sub-committee which has had several discussions and correlated the best methods in use.

Rubber-coated fabrics have been used for many years, but the war emergency has greatly extended their production and huge quantities are used in connection with life rafts, certain types of boats, balloon cloth, and the like, so that the necessity of adequate standardized methods for evaluating the fabrics has been pressing.

Following a statement on standard condition, the methods provide for the following determinations: dimensions (length, width, thickness and weight), breaking strength, bursting strength, elongation, tearing strength, hydrostatic resistance, and adhesion of coating to fabric. The standard is being included in Part III of the 1943 Supplement to the A.S.T.M. Book of Standards, and is also in the 1944 compilation of the A.S.T.M. Standards on Rubber Products, now being printed. Copies are also available separately on request.

The sub-committee in charge of rubber-coated fabrics is carrying out further research work on procedures for evaluating other properties which may be added when agreed upon. However, the basic methods are made available through the new tentative standard.

In addition to the rubber-coated fabrics tests, Committee D-11 has acted to have its four emergency specifications covering various types of compounds for insulated wire and cable issued as regular tentative standards. These emergency standards covered chloroprene sheath compound and heat-resisting and performance synthetic rubber compounds. The four specific standards are:

(a) Chloroprene Sheath Compound for Electrical Insulated Cords and Cables — D-752-43-T; (b) Chloroprene Sheath Compound for Electrical Insulated Cords and Cables where Extreme Abrasion Resistance is Not Required — D-753-43-T; (c) Insulated Wire and Cable: Heat-Resisting Synthetic Rubber Compound—D-754-43-T; (d) Insulated Wire and Cable: Performance Synthetic Rubber Compound — D-755-43-T. These four specifications were formerly Emergency Specifications ES-28, ES-30, ES-33, and ES-34, respectively.

The emergency specifications were originally prepared by Committee D-11 because of the crude rubber situation and the necessity of having standardized requirements for synthetic rubbers that were satisfactory for service in connection with insulated wire and cable. The committee feels that these requirements have proved satisfactory and that in some cases, even with a renewed supply of crude rubber, synthetic compounds may continue to be used in certain applications because of superior properties, and consequently the requirements might well be changed from the emergency to the regular status in A.S.T.M.

### American Hard Rubber Co.

For 1943: Net profit of $228,847, equal to $1.05 a common share, which compares with net profit of $330,548, or $2.18 a share, reported for the previous year.

### New Plasticizer and Tackifier

Two new materials which are reported to be finding favor in the manufacture of Buna S (GR-S) and other synthetic rubber products, particularly on the Pacific Coast, are products of the Rubber Research & Manufacturing Co., 3229 East Foothill Boulevard, Pasadena 8, Calif. The materials are L.J.O., a plasticizer, and L.J.A., a tackifier. According to the company, the major output of both of these materials is currently being used in the manufacture of camelback, but a 100% GR-S steam hose and 100% GR-S belting, both incorporating the new materials, have been made and have stood up under grueling tests. Executives of the company, organized sometime last year, include F. A. Musgrave, general manager; R. E. Erickson, production manager; and J. W. Jean, consulting chemist.

## ADVANCE REGISTRATION URGED FOR SPRING MEETING OF RUBBER DIVISION

As previously reported, the Spring Meeting of the Division of Rubber Chemistry, A.C.S., will again be held at the Commodore Hotel in New York City. The meeting will cover a three-day span—Wednesday, Thursday and Friday, April 26, 27 and 28. The complete program will appear in our next issue.

Because a record attendance is anticipated for the coming meeting—attendance at the Fall Meeting exceeded 1100—all those planning to attend the sessions are urged to fill out the "Advance Registration" form printed below and mail it as soon as possible. This will save considerable time, since once the form is mailed in all you will have to do upon arriving at Division headquarters is go to the Advance Registration desk, pay the required fee and pick up your lapel badge which will be prepared in advance.

The committee in charge of arrangements urges that you take special note of the following facts:

(1) This registration form has nothing to do with your hotel reservations; if you wish hotel rooms reserve them now at the hotel of your choice;

(2) Banquet and luncheon tickets will be on sale at the Registration desks; do not ask for reservations for tickets on the form below;

(3) No money should be sent with the "Advance Registration" form; the fees indicated are only intended to inform you of the amount which will be collected at the Registration desk at the meeting itself.

**DIVISION OF RUBBER CHEMISTRY—American Chemical Society**

New York City — April 26, 27, 28, 1944

**ADVANCE REGISTRATION**

Print Name ..... (Last / First / Middle)

Business Connection: .....

New York Address: .....

Check Your Proper Classification: (Do not send fee in advance)

| | Fee |
|---|---|
| Member American Chemical Society | ☐ $2.00 |
| Chemical Student | ☐ $2.00 |
| Visitors (Non-Chemical Only) | ☐ $2.00 |
| Visiting Chemists, from Outside United States | ☐ $2.00 |
| All Other Chemists | ☐ $5.00 |

The foregoing is correct (Sign here): .....

Inspector's Approval: | Fee:

**Fill in and mail to: Mr. W. J. Geldard, Naugatuck Chemical Division, 1230 Sixth Ave., New York 20, N. Y.**

# NEWS IN BRIEF

The Goodrich service flag now shows more than 7,000 men and women serving in the uniformed forces. According to President John L. Collyer, this number is equivalent to nearly one-fourth of the company's all-plants personnel before Pearl Harbor.

As the first step in a projected broad program of post-war expansion, Comprehensive Fabrics, Inc., distributors of Koroseal for Goodrich, has leased the entire 69th floor of the Empire State Building, New York City, according to Joseph A. Kaplan, president. The lease covers a total of 18,000 square feet of space. Alterations will begin immediately and the new quarters will be occupied as soon as possible.

A new chemical compound, called Turco Gummed Paper Remover, is being offered by Turco Products, Inc., as a solution to the troublesome problem of removing gummed paper from plastic glass sheets and formed parts. It is understood that airplane factories have experienced considerable difficulty in removing the tightly glued masking paper which covers the sheets and formed parts when they are delivered from the manufacturer. The new compound has been formulated for this special job.

A limited number of copies of a printed pamphlet entitled "Tire Repairs—Vulcanized (Passenger, Truck, and Bus Tires), Commercial Standard CS110-43," which was accepted by the trade as its standard of practice for new production beginning August 20, 1943, as announced July 20, 1943, are available. Requests for copies should be addressed to the Division of Trade Standards, National Bureau of Standards, Washington, D. C.

Reprints from *Chemical & Metallurgical Engineering* of the address, "What About the Postwar Future of Synthetic Rubber?" delivered by Rubber Director Bradley Dewey in accepting the Sixth Biennial Award for Chemical Engineering Achievement on behalf of the American Synthetic Rubber Industry, are available on request to the Rubber Manufacturers Association, 444 Madison Ave., New York City.

Traveling of members of America's armed forces has been made more interesting as the result of a booklet entitled "Fun En Route" over 2,000,000 copies of which have already been distributed free of charge by Firestone and the National Recreation Association. The booklet was prepared at the request of Army and Navy officials.

H. K. Porter Co., Inc., Pittsburgh, has opened an enlarged branch and export office at 50 Church St., New York City. The new office will serve as an Eastern center for the company's entire line of locomotives, process equipment and pumps.

Synthetic rubber life-saving suits which give Merchant Marine crews added protection against oil slicks are now in mass production at the Woonsocket, R. I., plant of the U. S. Rubber Co. The suits are mandatory equipment for all crews of vessels operated by the War Shipping Administration.

Koroseal Tape RX and Korolac RX are the names given to two new products for covering plating racks developed by the B. F. Goodrich Co., Akron. In some applications the two are used together, with the tape being applied after the rack has been coated with the solution, while in other cases they may be used separately.

Among the first to begin large-scale paper conservation, a committee to save paper and other vital war materials having been appointed in 1939, Firestone announces the current conservation of eight tons of paper daily, enough for 12,000 shell containers or 288,000 practice targets. Six tons of waste paper are baled and shipped to mills daily from Firestone's salvage plant, and the use of about two tons of new paper daily is avoided through strict conservation measures, it is announced.

Production of "rivnuts," a one-piece combination rivet and nut plate developed by Goodrich originally to fasten its rubber de-icers to airplane wings, has now expanded to the point where the fasteners can be offered for general industrial use. Rivnuts are described as threaded, tubular rivets which, by means of a special tool, can be "headed" from the "other" side, thus making it possible for parts to be fastened onto otherwise unreachable inside surfaces or in tight places in which a worker could not operate.

Lumirol Co., New York, is now fabricating ink distributing rollers used in off-set presses and duplicators of "Lucite," the methyl methacrylate resin developed by DuPont. The new type roller is said to be durable and is helping to solve the problem of replacing worn or scarred rubber rollers. A precision machining and grinding method guarantees the accurate dimensions requisite for proper performance.

### Testing Synthetic Tires

Huge bomber tires made of synthetic rubber, now being produced for the Army Air Forces by U. S. Rubber and other tire manufacturers, are subjected to test at Wright Field. In the accompanying photo, Major B. A. Davis and Captain L. V. Coursen of the Materiel Command Laboratory are examining a tire after a test run on the big inertia dynamometer wheel where it has been subjected to a "shock" landing equal to 150 miles an hour. The flywheel is brought up to the desired speed and then the tire is "landed" with a force equal to the wheel load of the airplane in question.

### Waterproof Instrument Bag

A waterproof instrument bag, developed for the Signal Corps by the U. S. Rubber Co., has been employed to advantage by American invasion forces in the present Italian and Southern Pacific campaigns to transfer delicate electrical equipment, medical supplies and food from ship to shore, it has been announced. It is reported to be the first piece of standard equipment to be used which employs natural air as a buoyancy factor in the transfer of heavy equipment in water. Made of heavy duck, coated with natural and reclaimed rubber compounds both inside and out, the bags have an overall thickness of not more than 3/16ths of an inch and vary in weight from 3 to 8 pounds. They are constructed in such a manner that air is trapped in the top of the bag after the instruments, etc., have been placed in them. The bags will withstand complete submersion in water for more than six days.

### New Witco Vice-President

C. A. Hemingway, who has been associated with the Witco Chemical Co., formerly known as Wishnick-Tumpeer, Inc., since 1922, has been elected a vice-president of that company. He will continue in charge of the company's Cleveland office where he supervises the sales of Witco products.

## DATA ON TIRE TREAD MATERIALS FURNISHED IN BUREAU REPORT

During the height of the emergency period, when all possible materials were being considered for the treads of pneumatic tires, determinations were made at the National Bureau of Standards of the rates of wear of several tread materials by weighing the tire at intervals and noting the loss in weight. This method involved a minimum amount of work and required relatively few miles of driving to obtain a reasonably reliable rate of wear which could be extrapolated to predict the life of the tread.

The results obtained showed the method to be feasible for passenger car tires and, in addition to yielding data on the value of different materials for treads, it indicated the effect of other details, such as the location of the tires on the car and the alinement of the wheels.

In the February, 1944, issue of the *Journal of Research*, published by the Bureau, data is given on five different tread materials, including prewar natural rubber treads. The rate of wear of the least resistant tread material was eight times that of the most resistant material. GR-S type synthetic—the principal rubber being manufactured—appears from these tests to be nearly as good as natural rubber.

### To Operate Ordnance Works

The Kankakee Ordnance Works at Joliet, Ill., one of the largest government-owned plants producing high explosives, will shortly be placed under the management and operation of the U. S. Rubber Co. The plant has been in charge of E. I. du Pont de Nemours & Co., and transfer to U. S. Rubber was said to be prompted by the urgent need to supply personnel for other government war projects being handled by DuPont. W. F. Tuley and J. W. Ackerman, manager and assistant manager, respectively, of the Pennsylvania Ordnance Works, also operated by U. S. Rubber, have been named to similar positions at Joliet.

### Phillips Has Akron Offices

The Phillips Petroleum Co., Bartlesville, Oklahoma, has established general headquarters in the First Central Tower, Akron, for the sale of its Philblack furnace blacks to the rubber and other industries. An extensive promotion campaign is now being formulated. Frank M. Andrews will act as sales manager of the newly-created Philblack Division. Mr. Andrews will also continue as general sales manager of the Hycar Chemical Co., formed by Phillips Petroleum and the B. F. Goodrich Co. It is also understood that Amos Oakleaf has left the Continental Carbon Co. to join the new Phillips office at Akron.

### Collapsible Container

The collapsible container illustrated herewith is made of asbeston fabric impregnated with synthetic rubber. It was developed by the U. S. Rubber Co. and

is used by the U. S. Army. The container is carried by airmen and by members of the medical corps for emergency use to supply them with a cooking utensil and for sterilizing operating instruments. Use of the container in the postwar period is said to offer many solutions to campers.

### New Resin Plasticizer

Paraplex G-25, a new resin plasticizer which can be used for all polyvinyl chloride resins and elastomers of the Buna N type, has been developed and introduced by the Resinous Products & Chemical Co., Philadelphia, Penna. It is described as a saturated polyester which is thermoplastic and chemically stable. The new material is readily soluble in esters, ketones, aromatic hydrocarbons and chlorinated hydrocarbons. Although it will not dissolve in alcohols, it will absorb up to 25% ethanol and 30% butanol. It is said to be highly compatible with the vinyl chloride resins, Buna N type synthetic rubbers, cellulose nitrate, chlorinated rubber, and certain thermosetting resins of the phenol formaldehyde type. It is also compatible with Buna S, neoprene, cellulose acetate propionate and polyvinyl butyral. Paraplex G-25 is supplied as a soft, tacky, viscous liquid which pours slowly at room temperature. It has a specific gravity of 1.06, an acid number of 3.0, a freezing point of 13 to 15°C., and a faint, characteristic odor.

### Form Broderick Rubber Co.

The Broderick Rubber Products Co. was recently organized in Chicago by Michael J. Broderick and others. At present, headquarters are maintained at 142 North Long Avenue, but the company is understood to be seeking larger quarters to expand its present manufacturing and experimenting of rubber products for both the current and postwar periods.

## REGULAR MEETING HELD BY NORTHERN CALIFORNIA GROUP

A regular meeting of the Northern California Group was held on February 24th at the Claremont Hotel in Berkeley, California, with approximately 40 members and guests in attendance. The feature of the evening was a talk presented by the group's president, Leonard Boller, assistant technical superintendent of the Pioneer Rubber Mills. Mr. Boller discussed neoprene, covering compounding, processing and vulcanization.

Following Mr. Boller's talk, John Liljegren, technical superintendent of the Pioneer Rubber Mills, gave a frank and interesting talk on the compounding of Butyl Rubber. Other speakers during the course of the evening included Bob Abbott, of the C. P. Hall Co. of California, who gave some interesting facts on magnesia, and Herman Jordan, Pacific Coast representative of DuPont. A general round-table on GR-S compounding was also held.

At the close of the program, a drawing was held for a leather wallet donated by H. M. Royal, Inc. It was won by Roscoe Burke of the Commercial Rubber Co., San Jose, California.

### Wishnick-Tumpeer Changes Name

Wishnick-Tumpeer, Inc., New York and Chicago, manufacturers and distributors of chemicals, pigments and asphalt products, has changed its name to the Witco Chemical Company. No changes in corporate structure, management or personnel are effected by the change in name which is based on the company's long-established trade-mark and which was prompted by the feeling that the name should be more descriptive of the business and consistent with the company's activities in the fields of chemical research and manufacture. Founded in 1920, Witco acquired the Pioneer Asphalt Co. in 1926 followed by the purchase of the Panhandle Carbon Co. in 1933. Four years ago a new research laboratory was added in Chicago along with the erection of a plant for the manufacture of chemical specialties. The change in name was effected on March 1 at which time it was also announced that the Witco Chemical Co. has been appointed sole distributor of the complete line of blacks manufactured by the Continental Carbon Co. at Sunray, Texas.

### New Plant for Casto Rubber

The Casto Rubber Co., which is headed by Dr. Glenn L. Casto, dentist of Spencer, West Virginia, whose development of a rubber-like material was brought to the attention of Washington officials some time ago, is reported to have purchased a factory in Marietta, Ohio, "for the manufacture of synthetic rubber." According to the report, approximately 100 people will be employed in initial operation of the new plant.

## GOODYEAR'S FUNDAMENTAL RESEARCH IN COTTON SHOWING RESULTS

Not generally known to the public, nor for that matter to the rubber industry itself, is the fact that a fundamental research program in cotton has been carried on by the Goodyear Tire & Rubber Co. since 1937. Part of the research in this program goes on in the new Goodyear Research Laboratory in Akron, part of it in a special greenhouse in Barberton, and the rest on cotton plantations at representative points across the entire cotton belt of America.

This fundamental program has already resulted in much new knowledge about cotton, about the physical characteristics of cotton most desirable for the tire industry, and in the introduction of several new strains of cotton into the American cotton belt. The entire program is under the direction of Dr. Burt Johnson, a member of the research laboratory, who prior to joining Goodyear was on the faculty of the University of Arkansas and on the staff of the Arkansas Agricultural Experiment Station.

### *Seek Correlation Data*

At the Barberton greenhouse Dr. Johnson maintains a series of gravel and water filled tanks out of which may come much new knowledge in the methods of growing cotton and, indirectly, improved tires. In these studies, Goodyear is seeking to find the correlation between methods of fertilizing and the resulting characteristics of the cotton lint as well as yield of the plant. Heretofore, much attention has been centered on developing new strains of cotton as a means of attaining desirable characteristics. These fertilizer experiments seek to bring out fully all the best potentialities of the fibers that the cotton experts had bred into the plant.

The gravel and water filled tanks already alluded to are used for experiments in so-called hydroponics or "water culture." These tanks, large, flat, shallow affairs, are in a greenhouse where temperature and humidity more nearly approach those of a southern cotton field. A series of pumps at stated intervals flood the tanks with water in which fertilizers, the so-called "plant foods," are dissolved. Then in due time, the fertilizer solution runs off. The gravel merely acts as a means of support for the cotton plants growing in the tanks and furnishes no food to the cotton plants, because the fertilizer solution furnishes the entire mineral nutrition for the plants.

Nitrogen compounds, phosphorus compounds, potassium and other compounds, are added to the water in various proportions and amounts. It is thus possible to operate each tank on a different schedule and to compare the results. Also, as the plant develops, the formula of the solution can be changed to fit each particular stage of growth of the plant.

Common practice in cotton growing has been to put all fertilizer in the ground in a narrow band near the seed row at the beginning of the season. Dr. Johnson in his greenhouse experiments has found that this may not necessarily be the best way, and he has attempted to translate results of the greenhouse hydroponics tests into practical use in the cotton field. He has tried fertilizing some plants in this traditional fashion while with others he has tried adding fertilizers at regular intervals throughout the growing season and particularly at the moment that the cotton bolls begin to form.

Although Dr. Johnson points out that it is not easy to translate these greenhouse experiments into practical operations on cotton plantations, experiments in this direction have been started. So far, his results are only preliminary but they seem to indicate that the ideal way to grow cotton may be to put certain fertilizers in the ground at the start of the season, adding others later. The important things, he believes, are to maintain a constant level of mineral nutrition at each stage of the plants' growth and to change the formula as needed, much as a mother changes the feeding formula of her growing child.

In the new technique, the fertilizer is spread thinly over all the space between the two rows of plants. Instead of placing all the fertilizer at once, only one-sixth of the usual amount is used. Another sixth is spread before each succeeding cultivation, so that eventually the plant gets the same amount as would be used if the fertilizer had all been applied at once at the beginning of the season.

Various plans for changing the formula are being tried. Considerably more work must be done before results can be regarded as final. In some of the experiments, a formula was used for the first three applications designed to encourage vigorous growth and high yield. Then at the fourth and later applications, a formula was used so that the plant would have minerals intended to make the longest fiber or the strongest fiber that the plant's genetics would permit. The preliminary results indicate that fiber properties may be influenced by mineral nutrition and that this can be accompanied by increased yield as well.

The variety tests have been carried out with the assistance of cotton growers from North Carolina to Arizona. Cooperating growers were each furnished with five to ten varieties and asked to plant a half-acre of each. Often these growers, because of their interest in the work, would put experimental patches on the edge of the road so that all growers in the neighborhood might easily watch the progress of the experiments.

The history of these cottons is carefully kept from the time the seed is planted until the cotton is destroyed in a tire test. Measurements are made of the cotton at all stages of manufacture—on the cotton fiber, the yarn, the cord, and the finished tires. Thus any characteristic of the cotton fiber can be co-ordinated with any given part of the record of yarn, cord, or finished tire.

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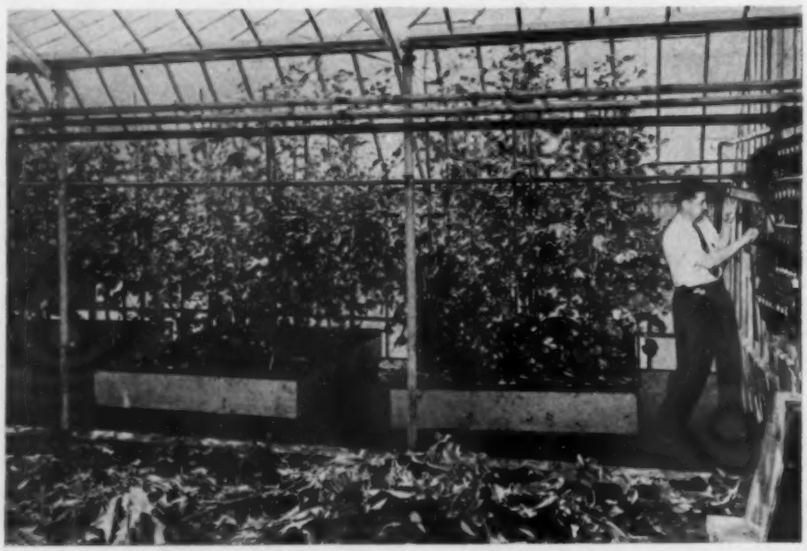
### Detroit to Hear Palmer

Dr. Henry F. Palmer, of the Firestone Tire & Rubber Co., who recently returned to that company after spending two years in Washington as administrative assistant of the Rubber Reserve Co., will be the principal speaker at the next meeting of the Detroit Rubber & Plastics Group, to be held at the Detroit-Leland Hotel in Detroit on Friday, April 21. In addition, the program will include the presentation of sound movies depicting actual activities on various war fronts. Dinner will be served promptly at 6:30 P. M.



*Growing conditions requiring exact temperature and humidity adjustments can be controlled in this Goodyear greenhouse at Akron.*

# NAMES IN THE NEWS

H. W. CATT, associated with the B. F. Goodrich Co., Akron, since 1929, has been appointed manager of the chemicals and pigments department of the purchasing division of that company. He succeeds DR. VICTOR E. WELLMAN, recently named director of purchases of the newly-created chemical division.

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DR. ORA STANLEY DUFFENDACK, who has been serving as professor of physics at the University of Michigan, has joined the North American Phillips Co. as director of research. He is a director of the National Defense Research Committee and will continue that work as well.

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DALE G. HIGGINS, formerly production manager of the Landers Corp., Toledo, Ohio, recently joined the Pantasote Leather Co., Passaic, N. J., as production engineer and assistant to the president.

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PAUL J. FLORY, until recently associated with the Esso Laboratories, Chemical Division, Standard Oil Development Co., Elizabeth, N. J., is now connected with the research laboratory of the Goodyear Tire & Rubber Co. at Akron, Ohio.

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WALTER D. BALDWIN, associated with the U. S. Rubber Co. for the past several years, was recently named sales manager of the newly-created Gillette Tire Division. A special field sales organization has been developed by the division.

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DWIGHT R. MEANS, associated with the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh, Penna., for the past 21 years, most recently serving as technical director, has been named assistant to the vice-president in charge of the division.

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DONALD RASOR, formerly associated with the H. O. Canfield Co., Bridgeport, Conn., has joined the Paragon Rubber Co., Easthampton, Mass., as factory manager, succeeding MARTIN JAFFEE, resigned.

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JAMES E. SKANE, associated with the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., who has been serving on a full-time basis with the Office of the Rubber Director at Washington, D. C., for the past several months, has returned to the company where he will handle allocations of crude and synthetic rubber among other duties. He will continue to serve the Rubber Director's office in an advisory capacity.

T. SPENCER SHORE, associated with the General Tire & Rubber Co., Akron, since 1931, and vice-president and treasurer since 1941, has resigned from that organization to rejoin the investment banking firm of Goldman, Sachs & Co., New York City, as a general partner. He recently served WPB as director of the industry advisory committee division.

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GEORGE A. WIEDEMER, associated with the Sieberling Rubber Co. for the past 22 years, most recently as manager of service sales, has been appointed manager of accessories and repair materials sales. ELLSWORTH H. WHIMS, with the company for 17 years, has been named assistant manager.

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ALBERT PFEIFER, formerly an official and general merchandise manager of Pfeifer Bros., Little Rock, Ark., has joined the firm of Ernst Seidelmann, New York City, as general merchandise manager. The firm is well known in rubber import and export circles.

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FREDERICK H. GEISS, chemist of the Calco Chemical Division of the American Cyanamid Co., has been transferred from Bound Brook, N. J., to the Chicago sales office where he will be concerned with the sale and service of the division's products to the paint, printing ink and pigment trades.

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L. D. "LARRY" WALKER, recently associated with Herron Bros. & Meyer, New York City, as a sales representative, and before that connected with the Triangle Conduit & Cable Co. for many years, has joined the Ideal Rubber Co., Brooklyn, N. Y., as production manager.

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WILLIAM D. TURNBULL, who has been vice-president and sales manager of the Pomona Pump Co. of California for the past four years, before which he was manager of the machinery electrification section of the Westinghouse Electric & Manufacturing Co., has returned to Westinghouse as manager of the agency and specialties department. He will maintain headquarters at East Pittsburgh, Penna.

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WESTMORE WILLCOX, JR., formerly a partner of Dillon, Read & Co., and a vice-president of Blyth & Co., has been named executive vice-president and financial officer of Comprehensive Fabrics, Inc,. New York City, distributors of Koroseal for the B. F. Goodrich Co.

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RALPH T. NAZZARO, formerly connected with the American Resinous Chemicals Corp., Peabody, Mass., is now affiliated with the Mellon Institute at Pittsburgh, Penna.

W. S. LONG, formerly operations manager of the Los Angeles, Cal., plant of the U. S. Rubber Co., has been appointed Pacific Coast sales manager of mechanical goods of the company. He will continue in charge of the company's war products activities on the Coast while J. W. MILLER will continue as factory manager of the Los Angeles plant.

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J. H. CLARK, general manager of sales for the Plastics Division of Monsanto Chemical Co., Springfield, Mass., since 1938 has been named sales director of that division. F. A. ABBIATI succeeds MR. CLARK as general manager of sales, while J. R. TURNBULL has been appointed assistant general manager of sales in charge of sheet materials and S. L. KING has been named sales manager of the vinyl resins department.

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FRANK T. MAGENNIS, assistant manager of the Goodyear Tire & Rubber Export Co., Akron, has been named a vice-president of that company. He has more than 25 years service with Goodyear, largely with the export company.

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ALEX MILLER, vice-president and general manager of the Royal Electric Co., Inc., Pawtucket, R. I., for the past several years, has left that organization and established the Miller Electric Co., also in Pawtucket.

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ROBERT MELTZ, who has been serving as factory chemist at the Perth Amboy, N. J., plant of the General Cable Corp., has left that organization.

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CLYDE F. HOOVER, previously with the U. S. Rubber Co. at its Providence, R. I. plant, has joined the laboratory staff of the Essex Rubber Co., Trenton, N. J., as director of rubber development. He is a graduate of Brown University.

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PAUL W. LEHMAN, chief engineer of the Detroit, Mich., plant of the U. S. Rubber Co. for the past thirteen years, and prior to that chief engineer of the old Cudahy, Wisconsin, plant of the Fisk Tire Co., for ten years, has left U. S. Rubber to join Giffels & Vallet, Inc., engineering organization, as consulting engineer.

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R. E. HEDLUND, sales manager, airplane tires and manufacturers sales, U. S. Rubber Co., has resumed his assignment in the U. S. Tire Division as assistant sales manager. He will also continue in charge of airplane tire sales.

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B. W. AVALLONE, associated with Pratt & Lambert, Inc., Buffalo, N. Y., for the past twelve years, has been appointed manager of the company's newly-created fabric coatings department of the industrial sales division.

# FINANCIAL NEWS

## GOODYEAR TIRE & RUBBER CO. REPORTS PROFIT OF $21,479,048

Based on consolidated net sales of $760,491,044, a new sales record for the company, the Goodyear Tire & Rubber Co. reports a net profit of $21,479,048 for the year of 1943. This compares with a net profit of $14,370,911, after renegotiation, based on sales of $451,493,034 for the previous year.

The 1943 earnings, which are after a contingency reserve of $5,000,000, are equal to $8.94 a share of common stock, and compare with $5.46 a common share for 1942 when $8,000,000 was set aside for contingencies. The profit figure represents 2.8% on sales before renegotiation.

In a statement accompanying the report, it was announced that Goodyear has negotiated a $100,000,000 revolving credit with banks, carrying a government guarantee of 90%, which is in addition to the $50,000,000 revolving bank credit previously reported. Both credits are available until June 30, 1947. Although the 1943 report was issued before renegotiations with the government on the year's contracts, it was emphasized that substantial voluntary price reductions on war goods were made throughout the year.

The statement also indicated that during 1943 the company paid a total of $251,019,820 in wages and salaries to an average number of 101,571 employees and that there are now 17,836 former employees in the armed forces. It also referred to the fact that with the consent of the government Goodyear voluntarily discontinued production of ordnance in two of its former tire plants and reconverted those plants to the production of tires and other rubber products for military and essential civilian needs.

## NET INCOME OF $11,584,501 REPORTED BY B. F. GOODRICH CO.

B. F. Goodrich Co. reports consolidated net income of $11,584,501 for 1943, after provision of $66,459,000 for estimated Federal and foreign income and excess profits taxes, less debt retirement and postwar credit, and estimated renegotiation of war contract prices, and after reserve of $4,000,000 for contingencies.

This is equal to $7.31 a share on 1,303,255 shares of common stock outstanding, after payment of the regular dividend of $5 a share on the cumulative preferred stock. Net income for 1942 amounted to $9,524,706, equal to $5.72 a common share, after all charges including a contingency reserve of $2,000,000 and provision of $30,266,000 for taxes.

Consolidated net sales for 1943 amounted to $374,408,710, which compares with $238,784,372 in the previous year, an increase of 56.8%. This dollar volume is after giving effect to substantial price reductions. The value of production from government-owned plants operated by the company is not included in the sales figures for either year.

The consolidated balance sheet as of December 31, 1943, shows current assets of $127,743,412 and current liabilities of $49,756,018, which compare with $109,447,543 and $33,966,618, respectively, at the end of the previous year. Cash increased from $12,220,930 to $14,521,633 and inventories went up from $57,469,308 to $61,772,990.

It was pointed out that renegotiation of war contract prices for 1942 were completed in mid-1943 and that the reserves provided in the 1942 report were sufficient to absorb its effect. Renegotiation of war contract prices for the year of 1943, it was said, has not yet been completed.

### Brown Rubber Company

For 1943: Net profit of $94,404, after provision of $1,500 for normal Federal income taxes, which compares with a reported loss of $93,867 for the previous year. A profit of $20,780, or 10c a share, was reported for 1941. Gross sales for 1943, less discounts, returns and allowances, amounted to $540,635. Total income before deductions amounted to $143,964. Total current assets as of December 31, 1943, were listed at $204,881, including $93,964 in cash, $68,181 in accounts receivable, and $42,736 in inventories, against total current liabilities of $84,553, including $56,268 in accounts payable. Net working capital at the year-end was $120,328, which compares with a deficiency of $84,417 at the end of 1942.

### Monsanto Chemical Company

For 1943: Net income of $5,365,775, equal to $3.56 per common share, which compares with $5,587,738, or $3.75 a share, for the previous year. Net sales amounted to $81,697,059, an increase of 18% over those of 1942. The 1943 statement excluded a profit of $1,048,858 from the sale of products manufactured in government-owned plants operated by Monsanto, this profit having been voluntarily returned to the government. Provision for estimated income taxes of $10,678,800 was made.

### Mohawk Rubber Company

For 1943: Net profit of $354,434 after all charges, including provision of $689,820 for Federal income taxes, which is equal to $2.50 per share, and which compares with $348,948, or $2.46 a share, reported for the previous year. Net sales increased 43%, from $3,685,505 to $5,290,996, with repair and recapping material sales accounting for a substantial part of the increase. Total current assets as of December 31, 1943, amounted to $1,645,360, including $495,609 in cash, against total current liabilities of $195,193, of which $104,681 represented accounts payable. After deducting dividend payments of $141,537, earned surplus was increased $212,897.

### United Carbon Company

For 1943: Net income of $2,047,327, after provisions of $1,020,000 for Federal taxes after postwar credit and $300,000 for contingencies, equal to $5.15 per share, which compares with $1,780,520, or $4.47 a share, after contingency reserve of $100,000 and tax provision of $1,669,200. Net sales increased from $10,314,859 to $11,394,908. Carbon black was responsible for 46.3% of total sales in 1943 compared with only 33.8% in the previous year.

### Dewey & Almy Chemical Co.

For 1943: Net profit of $566,003, equal to $1.88 each on 301,223 common shares outstanding, which compares with 1942 profit of $533,263, or $1.81 each on 295,317 shares then outstanding. Sales during 1943 amounted to $8,905,796, or 24% above the 1942 sales and 18% above those reported for 1941. Earnings before taxes increased to $1,297,022 from the $965,077 in the previous year.

### Dayton Rubber Manufacturing Co.

Year Ended Oct. 31: Net profit of $620,622, subject to renegotiation, equal to $2.99 a common share, which compares with $521,053, after provision of $300,000 for contingencies, or $2.42 a share, reported for the previous fiscal year. Net sales increased from $14,063,151 in 1942 to $17,892,636.

### Flintkote Company

For 1943: Consolidated net income of $1,250,276, equal to $1.51 a common share, which compares with $1,518,154, or $1.88 a share, reported for 1942 after adjustment for renegotiation. Net sales dropped from $31,906,953 in 1942 to $30,998,161.

### St. Joseph Lead Company

For 1943: Net profit of $4,033,974, equal to $2.06 a share, which compares with $5,655,625, or $2.89 a share, in the previous year. Net sales amounted to $47,099,749 against $51,360,604 in 1942.

### Frasche Heads Tire Plant

J. W. Frasche

J. W. Frasche, until recently in charge of purchasing for the California division of the B. F. Goodrich Co., has been named plant manager of the new tire factory now being constructed by Goodrich in Miami, Oklahoma. Contracts for the plant's construction have already been let. Mr. Frasche, a graduate of Iowa State College, joined Goodrich in 1928 as a member of its processing division training school. He was assigned to the industrial products division and later to the purchasing department, becoming manager of purchasing at the Oaks, Penna., plant. Later, he was appointed operating manager of the Goodrich plant in Clarksville, Tenn., serving there until August, 1940, when he was transferred to the California division. Mr. Frasche also directed the early operations of the government-owned plant at Louisville, Kentucky.

### Building Furnace Black Plant

Continental Carbon Company has begun the construction of a modern furnace black plant adjacent to its channel black plant in Sunray, Texas. Present plans call for the manufacture of two different grades of furnace black—Continex SRF, a semi-reinforcing type, and Continex FF, a high modulus reinforcing type. In announcing the new project, Robert I. Wishnick, president, explained that the company has been operating a single unit furnace plant for the past ten months in conjunction with a carefully worked out program of laboratory research and manufacturing control. Continex SRF is available for sampling by the industry under this program. Shipments of this black are scheduled to begin early in June through the Witco Chemical Co., exclusive distributors of Continental's products.

### N. Y. Group Meets March 31

The Spring Meeting of the New York Rubber Group will be held at the Building Trades Club, 2 Park Avenue, New York City, on Friday, March 31. The program includes two speakers and a sound movie. R. D. Young, former vice-president of the Rubber Reserve Co. and newly-elected president of the Rubber Trade Association of New York, will discuss the "Current Rubber Situation." J. W. Bicknell, vice-president of the Rubber Development Corporation, and plantation manager of the U. S. Rubber Co., will speak on the "Natural Rubber Program," and will cover developments in the Far East, Latin America and Liberia. The sound movie will be presented through the courtesy of the Navy and will portray actual battle scenes from Pearl Harbor to the Gilbert Islands under the title of "War on the Seas." Due to food rationing, it is essential that tickets for the meeting be secured in advance. Tickets are $2.50 each and are available from the group's secretary, Peter P. Pinto, c/o RUBBER AGE, 250 West 57th St., New York 19, N. Y.

### Hycar OR-25 Colored Blue

To assist rubber manufacturers in distinguishing between the different grades of oil-resistant Hycar and to prevent any confusion in the identity of these products, the Hycar Chemical Co. has announced that all Hycar OR-25 is now being manufactured with a pale but distinctive blue color. The blue tint is definite and unmistakable. The coloring is accomplished by adding a very small amount of methylene blue to the Hycar latex prior to coagulation and washing. The blue content in the dried rubber is less than five thousandths of one per cent. Tests on both conventional black and light colored stocks have indicated that the addition of methylene blue to the crude polymer has absolutely no effect on the physical properties of Hycar OR-25 compounds, nor on the color of light stocks. In the latter case, the blue-tinted polymer is reported to actually produce cleaner, brighter white and pastel stocks.

### Schade Heads New Laboratory

Appointment of James W. Schade, former director of research for the B. F. Goodrich Co., as manager of the government synthetic rubber laboratory and pilot plant currently being constructed in Akron by the Rubber Reserve Co., was recently announced by President H. E. Simmons of the University of Akron. The pilot plant and laboratory will be staffed and directed by the University. The former will have a staff of about 30 persons when in full operation while more than 50 will be employed at the laboratory. Sample runs of synthetic rubber have already been made in the nearly-completed pilot plant.

### Frazier with National-Standard

L. C. Frazier

The appointment of Larry C. Frazier to the sales engineering staff of the National-Standard Co., manufacturers of tire wire and other specialties for the rubber and allied industries of Niles, Michigan, has been announced by James C. DeGarmo, vice-president of the company. Mr. Frazier has a background of 14 years' engineering work on tire and hose problems while with the Gates Rubber Co. During the past few years he was associated with a well-known western tire and rubber company as vice-president in charge of production. In his present capacity, Mr. Frazier's broad technical knowledge will be directed toward the further development and use of National-Standard products.

### Form Utah Synthetic Rubber Corp.

The Utah Synthetic Rubber Corporation, 68 South Main St., Salt Lake City 1, Utah, was recently organized for the manufacture of synthetic rubber. The company is now in the process of establishing a pilot plant, although no details are available as to the type of synthetic to be made. Officers and directors of the new organization include the following: *President,* E. D. Hawkins; *Vice-President,* W. R. Anderson; *Secretary-Treasurer,* Alma Hambleton; *Managing Director,* Niels P. Larsen; *Plant Superintendent,* Alton F. Yates.

### General Buys Into Mansfield Tire

According to reliable reports, the General Tire & Rubber Co., Akron, has purchased a minority interest in the Mansfield Tire & Rubber Co., of Mansfield, Ohio. The interest was obtained through the purchase of 20 to 25% of Mansfield's capital stock. Mansfield's business in normal times is largely supplying private brand tires for mail order houses and oil companies.

# LOS ANGELES NEWS

Bill Davis, who has been the proprietor of the D and D Decorating Company, a firm that does rubber flocking work at 1480 East 56th Street, for the last three years, has sold out to Howard LaFollette, Leon Huey, and Walter Byrne, Jr. Mr. Davis plans as soon as possible to go to Cedartown, Georgia, his old home vicinity, where he will look after a family estate. He believes he will not get away, however, before the middle of May. The purchasers of the company were formerly employed by the Lockheed Aircraft Corporation.

Jim Bennett, factory manager for the Grizzly Manufacturing Company, has been quite seriously ill but is recovering nicely at this writing.

J. F. Johnston, assistant general sales manager for the B. F. Goodrich Company, industrial products division, recently spent a week in Los Angeles, coming here from Akron. H. E. Sheary, staff manager for the same division, spent a few days in Los Angeles recently also. Mr. Sheary also visited the other Pacific Coast points where his company is largely represented.

Here is an interesting note from the pages of the refreshing books of Jack London which everyone read with such avidity a generation ago. "Monty" Montgomery, local manager for Martin, Hoyt and Milne, reports the death of his aunt, Ninetta Payne, 94 years old, the woman, also an aunt to Jack London, who "discovered" the famous writer and urged him on his way to fame. Mrs. Payne crossed the prairies to California in a prairie schooner many decades ago, and her first husband was Roscoe Eames, publisher and owner of the "Overland Monthly," a famous journal with an adventure angle in the earlier Californian days. Mrs. Payne is mentioned in the story, "Sailor on Horseback," written by Irving Stone and appearing in the *Saturday Evening Post*.

E. D. Caram, proprietor of the Caram Manufacturing Company, recently completed a business trip which took him to San Francisco, Sacramento, Stockton and other Californian cities.

It is interesting to note that the 1944 Year Book of the Los Angeles Rubber Group, Inc., names nearly eighty rubber manufacturing firms in the Los Angeles area. This represents a tremendous growth in the last few years.

Herman J. Jordan, of E. I. Du Pont de Nemours and Company, now living in San Francisco, attended the March meeting of the Los Angeles Rubber Group, and exhibited a nose completely recovered from the bad injury received during the outing last summer.

Visiting for a week with Emmet Long early in March was John Blake, a sergeant pilot in the R.A.F. who had just completed training in Canada. Young Sergeant Blake is the son of James Blake who up until the time of his death was a director in the third oldest rubber manufacturing company in the world, the C. E. Heinke Company in London, England. Eric Blake, brother of the sergeant, is now serving as director in his father's place. Mr. Long, now with the Plastics and Rubber Products Company, Los Angeles, was formerly in the rubber manufacturing business in England and there became well acquainted with the Blake family.

Charles Lamb, Jr., of the Lamb Rubber Corporation, 801 Milford Street, Glendale, was on the sick list during the first part of March but at this writing is recovering.

R. P. Dinsmore, Goodyear vice-president in charge of development and research at Akron, spent a few days in the Los Angeles area recently.

Attending the rubber section meetings of the A.M.S. at the Mark Hopkins Hotel in San Francisco early this month were the following Los Angeles men: Ed Cunningham of Stanco; Bill Haney of the Kirkhill Rubber Company; Walter Boswell of the Thiokol Corporation; Claus Vonder Reith of the Sierra Rubber Company; Vic Vodra of the R. T. Vanderbilt Co., Inc.; Tommy Keenan of the Plastics and Rubber Products Company; Deke Maddy of the Hycar Chemical Company; George Steinbach of H. M. Royal, Inc.; Fred Woerner of L. A. Standard Rubber, Inc.; C. A. Sickels of the same company; and Ray B. Stringfield of Consolidated-Vultee Aircraft Corporation.

George Forde, of Los Angeles Standard Rubber, Inc., recently passed the California state bar examinations.

Ross Morris, senior rubber technologist of the Mare Island Navy Yard, is the father of a baby girl born recently.

Andy Makalin is the new plant manager at the Sierra Rubber Company.

Ed Royal has received word that his son, Stokes Royal, connected with the American Field Service, is now serving on a hospital staff somewhere in India.

## Symons Joins Drew Concern

**Ralph B. Symons**

Ralph B. Symons, until recently associated with the Firestone Tire & Rubber Co., has joined E. F. Drew & Co., Inc., of Boonton, N. J., and New York City. He will head up technical service for the rubber, plastics and allied fields and will handle sales development work on new products created by company research. The company manufactures the S. C. line of plasticizers distributed by the Standard Chemical Co. and is currently working on several new plasticizers and other materials for rubber and synthetic rubber compounding. Mr. Symons was born in Brantford, Ontario, in 1910, and received his degree in chemical engineering from the University of Toronto in 1933. From 1933 to 1937 he was associated with the Dunlop Tire & Rubber Goods Co. of Toronto, and from 1937 to 1941 with the Canada Wire & Cable Co., also of Toronto. In late 1941 he joined the Firestone organization and served at both the Fall River, Mass., plant and the bomb loading plant operated by the company for the government in Nebraska. Mr. Symons will make his headquarters at Boonton, where the Drew factory and laboratories are located.

Goodyear employees showed a keen interest in the launching of the liberty freighter, "S.S. J. Frank Cooper," on February 17 by the California Ship Building Corporation. The ship was named for the famed Goodyear employee who did so much toward the development and introduction of rubber boats. The sponsor for the vessel at the launching was Mrs. John H. Campbell, daughter of J. Frank Cooper. Acting as matron of honor was Mrs. John D. Steele, daughter-in-law of F. A. Steele, general superintendent of the Los Angeles Goodyear plant.

### Name Baybutt Vice-President

Richard Baybutt, head of Ernest Jacoby & Co., sales representatives and distributors of Boston, Mass., who has been associated with the Rubber Reserve Co. for the past year and a half, has been appointed vice-president of that governmeint agency, succeeding R. D. Young who resigned to become president of the Rubber Trade Association of New York. Mr. Baybutt joined Rubber Reserve in August, 1942, in charge of the latex division. In his new capacity, he will be in charge of the sales department, scrap rubber department and crude rubber purchases. Major activities of the scrap rubber department have been moved to the offices of the Distributing Agent of Rubber Reserve, located at 15 William Street in New York City.

### "Herebuna" Synthetic Rubber

The Heresite & Chemical Co., of Manitowoc, Wisconsin, manufacturers of Heresite plastic coatings and synthetic resins, has entered the synthetic rubber manufacturing field. The company has adopted the trade name of "Herebuna" for its synthetic rubber material, and intends to produce both the Buna S and Buna N types of synthetic. At present manufacturing operations are confined to the pilot plant stage, but the company expects to branch into full scale manufacture in the near future. Using a special formula, the company claims it can produce approximately 150 pounds of dry synthetic rubber per day in its present pilot plant. Heresite products are distributed in Canada by the Dominion Rubber Co., Ltd.

### Shift Executives at Bristol

Eight members of the Bristol, R. I., plant of the U. S. Rubber Co. recently received promotions, according to W. A. Armstrong, factory manager. W. K. Priestley, formerly chief of process engineering, has been made development engineer; L. E. Dickinson, chief chemist to chief process engineer; W. H. Dibble, assistant chief chemist to chief chemist; J. F. S. Abbott to chief latex engineer; F. S. Bartlett to assistant factory manager; T. C. Jannsen to production manager; A. E. Newton to general foreman of manufacturing departments; and J. Waters to foreman of latex towers.

### Boston Meets on April 14

The next meeting of the Boston Rubber Group will be held in the Main ballroom of the Hotel Statler, in Boston, on Friday, April 14th. Col. Bradley Dewey, U. S. Rubber Director, will be the principal speaker, although the full program has not yet been announced. Reservations should be made with the group's secretary, James R. Geenty, c/o Sanford Mills, Reading, Mass.

### Estimating Latex Yields

Possible time-saving methods of determining the productive capacity of certain crop plants have recently been suggested by histologists of the U. S. Department of Agriculture. For example, scientists of the Agricultural Research Administration, working on kok-sagyz plants, have found it feasible to make a rough estimate of the latex-yielding possibilities of individual plants by studying thin sections of the root to determine the pattern of latex tubes, their size and other characteristics. Since sections can be made of the lower ends of roots for comparison purposes, the plants that show most promise can be grown to reproduce themselves.

### Wehmer Heads Detroit Group

At an executive committee meeting held on February 18 the following officers of the Detroit Rubber & Plastics Group, Inc., were elected for 1944: *Chairman:* F. H. Wehmer (Minnesota Mining); *Vice-Chairman,* J. C. Dudley (Chrysler); *Secretary-Treasurer,* E. J. Kvet (Baldwin Rubber). In addition, W. E. Biggers and F. F. Riesing were elected members of the executive committee. The following chairmen were also named: *Program,* J. P. Wilson; *Entertainment,* J. R. Schroyer; *Counselor,* W. J. McCourtney; *Publicity,* J. W. Temple; *Membership,* A. J. Kearfott; *Education,* W. J. Phillips.

### Corona Insulated Moves Plant

Corona Insulated Wire Co., Inc., has moved its complete plant from Long Island City to 318 East 32nd Street, New York City. The move was effected during the latter part of last month and all operations are continuing at the new address.

### *Ralph E. Smith*

Ralph E. Smith, vice-president and general sales manager of the Webster Rubber Co., manufacturers and distributors of tire repair materials of Warren, Ohio, and a former executive of the old India Rubber Co. of Akron, died in Columbia, S. C., on February 23. Death was due to injuries sustained in a fall. He was 49 years of age, and was on a business trip at the time of his death.

Widely known in the tire field, Mr. Smith had been in the rubber business since he was 15 years old. He was appointed vice-president of Webster Rubber about five years ago. Funeral services were held in Lakewood, Ohio, where he made his home, on February 28. A widow and daughter survive.

### Schulman Shifts Representatives

Within recent weeks the firm of A. Schulman, Inc., scrap rubber dealers, with headquarters in Akron, Ohio, has shifted some of its territorial representatives. J. J. Costello, who has been managing the New York office at 500 Fifth Avenue, has gone to Akron; George Jatinen, temporarily assigned to the Boston office in the Statler Building, is now located at New York; while Dave Lundquist, formerly manager of the Boston office, who has been serving with the Office of the Rubber Director at Washington, has returned to Boston to continue his duties. Mr. Lundquist is vice-president of the company. In addition, Seymour Martin, formerly in the Rubber Director's office, has joined the company as assistant to Mr. Lundquist in the Boston office.

### To Hold Chemurgic Conference

The 10th Annual Chemurgic Conference of Agriculture, Industry and Science, sponsored by the National Farm Chemurgic Council of Columbus, Ohio, will be held at the Hotel Statler in St. Louis, Mo., on March 29, 30 and 31. The program includes a report on rubber progress by John L. Collyer, president of the B. F. Goodrich Co., and one on rubber developments by M. C. Teague, New Products Department, U. S. Rubber Co. One complete session, on March 29, will be devoted to plastics. Complete copies of the program can be secured from the National Farm Chemurgic Council.

### Reprint on Extruding Machines

John Royle & Sons, 10 Essex Street, Paterson 3, N. J., manufacturers of extrusion machinery for rubber, plastics and kindred compounds, as well as other types of machinery for the photo-engraving and textile trades, has made reprints available of the article on "Extruding Machines" by Justin H. Ramsey, vice-president of the company, which appeared in the December, 1943, issue of *The Royle Forum,* company house organ. The article traces the development of the modern extruder and explains its basic principles. Copies of the reprint are available without cost on request to the company.

### McCauley Heads Muehlstein Co.

W. J. McCauley, vice-president of H. Muehlstein & Co., Inc., New York City, and associated with that company for more than 25 years, has been elected president of the company succeeding Herman Muehlstein who becomes chairman of the board. Mr. McCauley has been serving as an administrative assistant in charge of scrap rubber for the Rubber Reserve Co. and recently returned to his duties with the Muehlstein company.

# CANADIAN NEWS

Canadian motorists had better preserve the tires they now have, for there is not much hope of synthetic tires being available for unessential drivers for another 12 or 18 months, R. C. Berkinshaw, president of the Polymer Corporation, and newly-elected president of the Ontario Motor League, declared in Toronto on March 6.

"All I can say is the situation depends very definitely on the supply of materials available and plant capacity to make tires," he said. "We need rubber, cotton and rayon. We're precluded from getting any large quantities of natural rubber, so have to conserve the stockpile on hand and use it until natural rubber flows again to our shores.

"Substitute material is gradually being produced in increased quantities and we in Canada plan to produce 30,000 to 40,000 tons of synthetic rubber to be used as a substitute each year. However, the demand for war purposes is increasing, and it will be some time before the substitute can be used for relatively non-essential purposes. Tire plants are operating at capacity, and I don't think they could produce another pound. Likely in 12 to 18 months the situation will change considerably, and I am quite sure those in charge will be first to recognize the need for increasing production for motor transportation."

Synthetic rubber tires were "standing up well in tests," so far as passenger tires were concerned, but there was difficulty with truck tires. "But the raw material is being improved and the technique of manufacturing slipping along," he said.

So far, he added, the Polymer plant at Sarnia, Ontario, has already produced 15 million pounds of synthetic rubber, and "we expect this month it will be turning out much more than previously."

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Synthetic rubber facilities that can be easily expanded in emergency should be maintained in Canada and the United States following the war, regardless of economic factors, said J. G. Hagey of the B. F. Goodrich Company, in an address to the Kitchener-Waterloo Junior Board of Trade.

"The experience in this war has taught us that we cannot afford to face the future without an adequate rubber insurance policy," he said. "Both the Army and the Navy during brief or prolonged periods of peace must maintain the nucleus around which to build adequate military strength for a long war."

Speaking on the future of synthetic rubber from an economic standpoint, he said, scientists can now see far enough ahead to say with certainty that there will be keen competition between natural and synthetic rubber for many uses. Special purpose synthetic rubber had superior qualities for scores of specialized uses. Wherever oil is present for example, this rubber is superior to natural rubber.

"From the standpoint of postwar planning, we face the fact that the potential world supply of natural rubber, plus synthetic rubber, would aggregate annually nearly 2,800,000 tons . . . more than twice as much as the whole world has ever used in a year.

"The peoples of the world should be the ultimate beneficiaries of the war-born, large-scale competition between natural rubber and synthetic rubber. This benefit may be anticipated in the form of lower cost raw materials, lower cost finished products, and the wider use of rubber made possible by its low cost, in many new applications."

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Because of the increase in the amount of income and excess profits taxes the net profits of the Goodyear Tire and Rubber Company of Canada, Limited, New Toronto, Ont., were less than those of 1942 by $470,020, A. G. Partridge, president, told shareholders at the annual meeting in Toronto on February 25. He said a comparison of operations showed an increase in sales and a reduction in selling expenses for the year just ended.

Net earnings of $1,448,536, excluding $276,672 refundable portion of the excess profits tax, equal to $4.51 a share on the common stock, was reported. This compared with $1,913,557 or $6.83 a share in 1942. The balance sheet showed net working capital of $10,412,214 compared with $10,298,859 the previous year-end. A reserve of $635,516 was set aside for depreciation.

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Synthetic rubber made from wheat alcohol is superior to the product produced from petroleum but the Dominion Government is silent as to which method is to be used by Canadian rubber factories in the post-war years, E. O. Duke (Social Credit, Pincher Creek-Crowns Nest) declared recently in the Alberta Legislature. "We have a right to know how our synthetic rubber is to be made," he said in a Throne Speech debate. The Western Canada farmer would have a market for his wheat if it was used for this purpose, he said, adding that he hoped the Dominion Government "would not sell the farmer down the river," by using petroleum. Mr. Duke suggested Federal authorities should place a floor price on all farm products. These should be held for five years after the war "so that the farmers may make a legitimate profit."

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Fifteen cents a pound is the most optimistic post-war estimated price at which synthetic rubber can be produced, while natural rubber can probably be delivered in America at 10 to 12 cents a pound, John Symons told a Toronto Club on February 3. Mr. Symons, departmental manager of the Canadian Rubber Company, suggested post-war reversion of the use of natural rubber with some possibility that blends of synthetic and natural rubber might produce a superior product.

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Edward Ernest Chisnall, 77, branch manager of the Gutta Percha and Rubber Company in Ottawa for many years and a native of England, died in Ottawa Civic Hospital on February 23 after a brief illness.

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Tires for ordinary passenger cars will be available by "October, November, certainly by December, 1944," J. Penfield Seiberling, president of the Seiberling Rubber Company, Akron, told the Canadian Section of the Society of Automotive Engineers in Toronto on February 16th. Mr. Seiberling urged truck operators, however, to be more careful than ever during the coming summer, and predicted there might be a shortage of between 700,000 and 800,000 of the heavy-duty tires, which, he declared, were a much worse problem than those for passenger cars.

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C. Roy McGregor, 51, for the past twenty years on the sales staff of Gutta Percha & Rubber Company, of Montreal, died February 21 at his home in Montreal. He is survived by his wife and three sons.

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A. Beverley Lewis, chief chemist, has been elected a director of the British Rubber Co. of Canada, Limited.

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### Offer Lubrication Plan

The Sun Oil Company is now offering to industry its "Save and Serve Campaign." This is a complete program to help industry save time, machines and labor and thus serve America with more efficient production. The purpose of the campaign is to provide maintenance data on proper lubrication, prolong the life of machines, conserve labor by increasing production per unit, and save time by reducing "down time" for repairs. Printed literature is available to all manufacturing industries adopting the plan, including lubrication booklets, wall charts, plant posters, industry folders, technical bulletins, and maintenance memos. Complete and detailed information concerning the campaign can be secured by any manufacturer by addressing an inquiry to the Sun Oil Co., Department 18, Philadelphia 3, Penna.

### Yale Completing Rubber Course

The special course in rubber technology given this semester at the Yale University School of Engineering under the Engineering, Science and Management War Training Program is nearing its completion. The current course covered 15 lectures, each lecture utilizing speakers from the industry. The course met one evening each week for 2½ hours, the first part of the evening being given over to a lecture on some phase of rubber technology and the second half to a discussion of the problems involved. Subjects covered to date and their lecturers follow: *Synthetics,* E. J. Geise (U. S. Rubber); *Buna S,* G. R. Vila (Naugatuck Chemical); *Neoprene,* E. H. Krismann (DuPont); *Butyl Rubber,* G. Taylor (Stanco Distributors); *Carbon Black,* C. R. Haynes (Binney & Smith); *Non-Black Fillers,* A. R. Lukens (Thompson Weinman); *Softeners,* B. S. Garvey, Jr. (Goodrich); *Accelerators,* F. L. Holbrook (Naugatuck Chemical); *Footwear,* E. J. Geise (U. S. Rubber); *Drug Sundries,* W. J. O'Brien (Seamless Rubber); *Wire,* I. C. Eaton (General Electric); *Tires,* Otto Lang (Armstrong Rubber); *Hard Rubber,* C. M. Doede (Connecticut Hard Rubber). A lecture on sponge rubber and a period devoted to summation remain to complete the course.

### New Type Landing Mechanism

The harnessing of air to absorb the shocks of airplane landings, take-offs and taxiing runs is reported to be made possible by a new type landing mechanism developed by the Firestone Tire & Rubber Co. Called an air-spring strut, the air is confined in a flexible rubberized container which operates much like an accordian bellows. With the air-spring, all the shock-absorbing properties of a pneumatic tire are repeated in the landing strut. Oil has heretofore been generally used to absorb the tremendous energy of an airplane's first impact in landing. The oil is confined and forced through a small hole at high pressure. The Firestone air-spring uses an identical principle, except that a large volume of air at low pressure is used instead of oil.

### New Tire Carcass Construction

A major step is said to have been taken in the improvement of synthetic rubber truck tires through the development of a new type of tire carcass construction by the U. S. Rubber Co. With greatest strain and heat in truck tires usually occurring in the carcass directly under the tread of the tire, the new construction, known as the inlaid carcass, places from 10 to 30% of crude rubber in this critical region of the tire. The crude rubber is placed directly under the tread and as far down into the carcass as the amount of rubber specified will permit. Synthetic rubber is used in the other parts of the carcass.

### New Manufacturing Concern

The formation of Cordage, Inc., for the manufacture of rubber-jacketed and retractable electrical cords, has been reported in Chicago. Formation of the

new concern is said to mark a forward step in the development of the features that have made the Kellogg Koiled Kord the choice of thousands of independent telephone men and, currently, many branches of the Armed Services. Officers of the new organization are C. D. Manning, president; R. D. Collins and H. D. Hurlbut, vice-presidents; and E. Johnson, secretary-treasurer. P. C. Geraty, for many years head of the insulating department of the Kellogg Switchboard & Supply Co., Chicago, has been appointed manager. All orders for products of Cordage, Inc., will be handled through the Kellogg company.

### More Names in the News

NORMAN W. SMITH, technical supervisor of the rubber reclaiming plant operated by the Dominion Rubber Co. in Montreal, Canada, has been appointed manager of sales and service for reclaimed rubber and dispersites of that company. He has been with the company for the past five years.

RAYMOND A. HELLER, superintendent of the White Rubber Co., Ravenna, Ohio, was recently elected councilman-at-large of the Ravenna Council. A native of Ravenna, he has been associated with White Rubber since 1922.

F. WARREN BICKEL, formerly associated with the Hastings-on-Hudson, N. Y., plant of the Anaconda Wire & Cable Co., has joined the Diamond Wire & Cable Co., Chicago Heights, Ill., as chief chemist.

HARRY I. KLEINERT, SR., vice-president in charge of the College Point, L. I., plant of the I. B. Kleinert Rubber Co., was honored at a dinner in New York City on March 10 commemorating fifty years of service with the company. He was presented with a diamond-studded service pin.

CHARLES E. SAUVAIN, assistant treasurer, KENT A. MOODY, secretary, and JOHN A. CHRISTIE, factory manager, were all recently elected to the board of directors of the Mohawk Rubber Co., Akron.

### Develop Propeller "Skin"

Formation of ice on propellers of planes in flight is now being overcome by a new electrically-heated propeller "skin," made in part of a special conductive synthetic rubber, that enables the propeller surface to warm up like a sickbed heating pad, according to an announcement from the B. F. Goodrich Co., Akron. The "skin" is made of a combination of two kinds of synthetic rubber, the outer surface being a thin coating that is tailor-made to conduct electricity instead of blocking its flow. Since the current comes from a generator attached to the shaft, the propeller can be kept warm and ice-free as long as the engine is running. It was pointed out that this electric-warming method of deicing was at present applicable only to relatively small surfaces. Perfection of a new "electronic ice-pick" to give airplane pilots accurate and instantly variable control of their De-Icer equipment in combating every type of ice formation, developed by engineers of the Goodrich and Bendix Aviation organizations, was also recently announced. Basically, the new device enables the pilot to vary the frequency of the pulsations to give maximum effectiveness in relation to the thickness and type of the ice being formed.

### Reichhold Expands Research

Reichhold Chemicals, Inc., Detroit, Michigan, manufacturer of synthetic resins and chemical specialties, including Agripol, one of the chemurgic rubbers, is centralizing the work of all of its research laboratories in Detroit where a rather complete program of reorganization has taken place. Heading up the company's reorganized research department is John J. Bradley, Jr., director in charge of research. The research laboratory is now divided into seven separate and distinct units, covering respectively coating resins, phenol plastics, chemicals, chemical pigments, patents, market research and special compounds. Reichhold Chemicals maintains an executive research advisory board.

### Additional "E" Awards

Included among companies receiving the Army-Navy "E" award in recent weeks for production efficiency were the following:

Detroit Gasket & Manufacturing Co., Marine City, Mich.

Firestone Tire & Rubber Co., Gastonia, N. C.

Monarch Rubber Co., Hartville Plant, Hartville, Ohio.

In addition, a second star, representing continued high performance in the production of war materials, has been awarded to the Niagara Falls, N. Y., plant of the B. F. Goodrich Co., and a fourth star to the Jenkins Bros. plant in Bridgeport, Conn.

# OBITUARIES

### *Bevis Longstreth*

Bevis Longstreth, president of the Thiokol Corporation, Trenton, N. J., both a pioneer and a leader of the American synthetic rubber industry, died on March 1 after a short illness. He would have been 51 years old on March 19. His death came as a shock to the rubber industry.

Born in St. Louis, Mo., Mr. Longstreth was graduated from Princeton University in 1915. At college, he was president of his class and was prominent in university sports, being a member of

the football and wrestling teams. Following graduation from Princeton, he entered Harvard Law School, which he left in 1917 to join the Army. He saw service in France as a second lieutenant in the Tank Corps.

Returning to civilian life, Mr. Longstreth went to Kansas City, Mo., to head the Bevis Rock Salt Co., with which concern his family had long been identified. It was in his capacity as president of this company that Mr. Longstreth commissioned Dr. J. C. Patrick to conduct research on new ways of using salt, one indirect result of this research being the development of oil-resistant elastomers, later called Thiokol. Shortly thereafter, Mr. Longstreth organized the Thiokol Corporation at Trenton, N. J., to develop and manufacture Thiokol. Dr. Patrick is vice-president and director of research of this organization.

Mr. Longstreth was a director of several industrial concerns. In addition, he was a member of the Graduate Council of Princeton University, Chemist's Club of New York, Princeton Club of New York, Trenton Club, Pretty Brook Club of Princeton, and of several technical associations. He had made his home in Princeton, N. J., for many years, and was active in the affairs of the university and of the community itself.

Funeral services were held in the chapel of Princeton University, with many leading figures in the rubber, petroleum and transportation field, as well as a large number of family and business friends, in attendance. Surviving are a widow, two daughters, a son, and two step-sons.

### *R. Earl Demmon*

Roy Earl Demmon, vice-president and director of sales of the Stauffer Chemical Co., New York City, died unexpectedly at Daytona Beach, Florida, on February 14, at the age of 52. Born in Sacramento, Calif., on August 4, 1891, he attended Lowell High School in San Francisco and the University of California.

Mr. Demmon was associated with Stauffer Chemical for thirty-five years, joining the company in March, 1909. In 1920 he was appointed general manager of the company's Houston properties and in 1929 also assumed the management of the Indiana branch. In 1936 he was appointed assistant vice-president and director of sales in 1941, serving in that capacity until his death.

Mr. Demmon was a director of several chemical organizations, including the Old Hickory Chemicals Co., Cornwall Chemicals, Ltd., Niagara Smelting Corp., and the Philadelphia Quartz Co. He was a member of the Masonic Order, Siwanoy Country Club, Bronxville Field Club, Chemists Club, and the Uptown Club. He was also a member of various technical associations.

Funeral services were held in Bronxville, N. Y., on February 18. A widow and son survive.

### *Dr. Leo H. Baekeland*

Dr. Leo Hendrik Baekeland, inventor of Bakelite and often termed the "father of the modern plastics industry," died at the age of 80 on February 23 in Craig House, a sanitarium in Beacon, N. Y., where he had been a patient for several months. A native of Ghent, Belgium, Dr. Baekeland came to the United States in 1889. He first developed Velox photographic paper, which Eastman Kodak purchased from him, and with the money received for the patent rights to this material he built a laboratory in Yonkers, N. Y., where Bakelite was developed. The development was first announced in 1906 and from 1910 until his retirement in 1939, Dr. Baekeland was president of the Bakelite Corp. During that period he received almost every honor and award possible from the chemical industries.

### *Barthold De Mattia*

Barthold De Mattia, president of the Accurate Manufacturing Co., manufacturers of friction and rubber tape of Garfield, N. J., died on March 2 in Hollywood, Florida, as the result of a heart attack. He was 62 years of age.

Born in Italy, Mr. De Mattia came to this country when he was a boy and after receiving his schooling worked for various textile mills in Passaic and Paterson, N. J. He quickly adapted himself to the role of machinist and even as a youngster made several valuable suggestions to his various employers for improving their production capacity by minor adjustments to their machinery.

Based on his knowledge of machinery, Mr. De Mattia and his brother Peter established the De Mattia Foundry and Machine Co., locating in Garfield, N. J., with a branch plant in Clifton, N. J. This company was sold to the National Rubber Machinery Co. in 1928. For the next several years, Mr. De Mattia acted as a consulting engineer for several of the larger rubber companies, and in 1934 established the Accurate Manufacturing Co. The De Mattia brothers held several patents for rubber manufacturing equipment.

Active in civic affairs, Mr. De Mattia was a director of the Passaic Chamber of Commerce and of the Rotary Club. He served as the Clifton representative of the Community Chest Association and as a director of the Clifton Red Cross. He was a life member of the Passaic Elks Club and a member of the Clifton Board of Education. He was also a director of several building and loan associations.

### *Julian W. Curtiss*

Julian W. Curtiss, former president and chairman of the board of A. G. Spalding & Bros., Inc., who became an advisory counsel in 1939 after fifty-five years of various executive capacities, died in Greenwich, Conn., on February 17, after a ten day illness. He was 86 years of age. Born in Fairfield, Conn., Mr. Curtiss attended Brooklyn Polytechnic Institute and was graduated from Yale University in 1879 with a B.A. degree. He entered the employ of the Spalding concern soon after his graduation and was made vice-president and secretary in 1884. In 1920 he was elected president and from 1933 to 1939 served also as chairman of the board of directors.

### *Owen W. White*

Owen W. White, treasurer of the Fabric Fire Hose Co., Sandy Hook, Conn., an affiliate of the U. S. Rubber Co., died of a heart attack on February 20 shortly after being admitted to Danbury (Conn.) Hospital. He was 50 years of age. Mr. White, who was born in Brooklyn, N. Y., had been employed by U. S. Rubber in an accounting capacity for several years before being appointed treasurer of Fabric Fire Hose. A widow survives.

## Properties of the Geon Polyvinyl Resins

THE new series of Geon Polyvinyl Resins recently introduced by the Chemical Division of the B. F. Goodrich Co., Akron, Ohio, offer several interesting possibilities. They can be processed easily on existing equipment and should expand the field served by this class of plastic materials. Among the principal applications of the new materials, which are subject to allocation by WPB under General Preference Order M-10, are the coating of fabrics, paper, foil and other materials, as well as the insulation of wire, manufacture of film for packaging, and the manufacture of molded and extruded products.

Two chemical types are offered currently. The Geon 100 series are special vinyl chloride polymers characterized by their thermal and light stability, toughness and chemical inertness. Geon 101 was developed especially for electrical applications, such as wire and cable insulation, while Geon 102 is adaptable to general services.

The new Geon 200 series was created to meet the need for polyvinyls which combine increased solubility and thermoplasticity with exceptional stability, chemical resistance and wide useful temperature range. Their resistance to hydrolysis by boiling water or even hot alkali is said to be outstanding in the field of vinyl chloride copolymers, and like the 100 series they have unusual stability to light and heat. Geon 202 is a general-purpose copolymer, more soluble and thermoplastic than either of the Geon 100 resins, while these characteristics are still further stepped up by Geon 203.

PROPERTIES OF THE GEON RESINS

| Geon Number | Specific Gravity | Average Acetone Extract | Average Specific Viscosity* | Recommended % Solids in M.E.K.** @20° C. | @70° C. | Plasticizer Index*** |
|---|---|---|---|---|---|---|
| 101 | 1.41 | 15% | .55 | 4.5 | 12 | 43 |
| 102 | 1.41 | 14% | .59 | 4.5 | 12 | 43 |
| 202 | 1.43 | 48% | .40 | 8. | 17 | 34 |
| 203 | 1.44 | 56% | .36 | 14. | 25 | 31 |

* At 20° C. of 0.4% Solution in Nitrobenzene. ** Methyl Ethyl Ketone. *** Weight of dioctyl phthalate per 100 weights resin to give comparable hardness at room temperature.

Geon resins, when compounded with other materials can be processed in many ways, including injection and compression molding, extruding, calendering, solution coating and film casting. Compositions varying from the rigid thermoplastic to a very soft jelly can be obtained by modifying the resins with other compounding materials. Each composition exhibits the many desirable characteristics of the base resin used.

Among the outstanding qualities of plastics made with these resins are the combinations of rubber-like properties with nonflammability and resistance to oxidation. Compositions made from Geon 100 series are characterized by their resistance to deformation at elevated temperatures, in comparison to other vinyl thermoplastics.

In addition to furnishing the resins in powder form with the compounding done by the purchaser, Goodrich will also supply them in ready-to-use form, either as granules or sheet. Standard Geon plastic compounds are available for many uses.

In addition, other tailor-made formulations can be supplied for special purposes. It is pointed out that because these materials can be varied so widely in useful properties, it is to the advantage of the prospective user to consult the manufacturer in choosing a compound formulated to fit a specific need.


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DENVER—The Denver Fire Clay Co.
DETROIT—C. L. Huesten
LOS ANGELES—The C. P. Hall Co. of California.
MONTREAL—Canadian Industries, Ltd.
NEWARK, N. J.—Chas. S. Wood & Co., Inc.
PORTLAND, ORE.—Miller & Zehrung Chemical Co.
ST. PAUL, MINN.—George C. Brandt, Inc.
SEATTLE, WASH.—Carl F. Miller & Co.
TRENTON, N. J.—General Supply & Chemical Co.

# NEW EQUIPMENT

## Chronotrol Heating and Cooling Instruments

A line of instruments to enforce any desired heating or cooling program has been developed and introduced by the Wheelco Instruments Co., Harrison and Peoria Streets, Chicago 7, Ill. Named Chronotrols, the instruments are built around the company's established line of pyrometers, potentiometers, thermometers and resistance thermometers, all of which employ an electron-

ic principle of effecting temperature control. They provide completely automatic temperature regulation, regardless of the changes in temperature desired for a given process or application. The temperature cycle desired is cut on a disc, and its rotation by a synchronous motor moves the temperature setting lever.

Chronotrols are offered in 25 models, including ten for proportioning control and others for two-position on-off and three-position on-intermediate-off controls for high- and low-temperature applications. Thermometer models are available in recording as well as indicating types.

Absence of mechanical linkage between the measuring and control sections of Wheelco Chronotrols makes possible instant response of the instrument's control unit to changes in temperature noted by its sensing unit. The frequency of oscillating current flowing between pick-up coils, mounted on the temperature control setting index, is changed when a control flag mounted on the pointer or pen arm is moved between the coils by a temperature rise, or is moved from between the coils by a temperature drop. This frequency change in the control circuit governs the output current of a vacuum tube, acting to open relay contacts which, in turn, operate fuel valves or switches.

## Atlantic B-C Grinding Wheels

A grinding wheel for finishing molded synthetic rubber products which cuts fast, clean and cool without pulling or crowding the softest rubber compounds has been introduced by the Atlantic Abrasive Corp., 562 Pearl St., South Braintree, Mass. Called the Atlantic B-C Grinding Wheel, the abrasive grinder is said to remain cool on all types of rubber, completely removing the fire hazard in grinding or finishing operations. The wheel was developed to meet the need for safe and economical finishing of molded parts for mechanical rubber goods.

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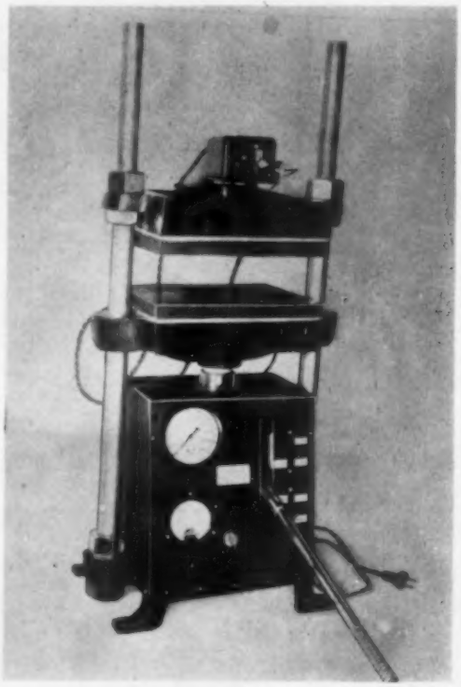

plastic materials, compression testing of heavy springs and cushioning materials, breaking and testing to destruction point of structural members, and pressing out of oils and waxes.

The hydraulic mechanism of the press provides a total available force of 24,000 pounds, with attached pressure gauges to measure the indicated pounds per square inch, ram pressure. Conversion from ram pressure to force is readily made. The gauge is of highest quality, and can be overloaded without danger of damage. The platen area of the press is 70 square inches and about twice the size of the usual laboratory press. Width between columns is 11 inches and the stroke is 8 inches. The press itself is 36 inches in height and weighs 225 pounds. Regular wattage is 1600 but special platens for higher heat can be secured as special equipment.

The continuous temperature indicator is of the thermocouple type while the thermostat is of the vapor bulb type and controls temperature up to 550 degrees with a differential of 15 degrees. Thermometer wells are drilled in the platens to accommodate the regular mercury thermometer which permits greater accuracy and allows for checking the scale reading of the millivoltmeter attached to the thermocouple. The press is supplied for either 110 or 220 volt operation, A.C. or D.C.

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## Two-Dial Rotary-Type Process Timer

A new two-dial rotary-type process timer which regulates the flow of products in catalytic processes, such as the production of butadiene, toluene and high-octane gasoline, has been developed by the Switchgear Division of the General Electric Co., Schenectady, N. Y.

During the manufacture of these products, hundreds of accurately timed, sequential operations must be performed. Some of these operations involve the opening and closing of electrically operated valves, dampers, and other devices in a definitely timed cycle. Depending on the process requirements, a complete cycle of operations may require from twenty minutes to three hours, or more; from 18 to 75 devices may be controlled; and from 100 to 900 contact points or timing intervals may be needed.

These requirements are met by the new process timer in which each of the two dials has two concentric rings or rows of 224 contact points each—a total of 896. Each dial has a rotating contact arm. The arms are geared to a single shaft and can be driven through a clutch by a synchronous motor and adjustable gear train, or they can be operated independently from separate motors. A spare motor and a handwheel for operating the unit manually are also available. The circuit to the segments is made and broken through an auxiliary switch, not at the segments, and the unit will easily handle control circuits of 10 amperes, 125 volts.

Essentially a large motor driven selector switch, this timer operates at a speed which may be selected to suit the process. It is arranged to complete the circuit to the controlled device or an alarm circuit as a moving brush selects each point. Flexible jumpers are provided for connecting between the segments and a terminal board. The jumpers are plugged to the segments which will provide the desired operating cycle, and all incoming control leads are brought to the terminal board.

---

Based on an improved process of graduating black lines on white vinylite, a new slide rule that is accurate and will retain its accuracy indefinitely has been introduced by the Tavella Sales Co., 27 West Broadway, New York 7, N. Y. Called the **Monitor Slide Rule,** it is small in size and light in weight and is especially adapted for carrying in brief cases. The front side has four scales—Log, C, D and CI or C inverted scale—and the reverse side has sine and tangent scales and A and D scale for finding squares and square roots.

---

An infra-red test kit, which contains 1,000 watts of concentrated electric power ready to deliver 3,000 BTU's of infra-red heat instantly, when on full, has been introduced by Infra-Red Engineers & Designers, 1633 East 40th St., Cleveland, Ohio. Called the **Miskella Infra-Test-Kit,** it is 36 inches high, 12 inches wide, 12 inches deep, and weighs 30 pounds. It is wired for 115 volts, unless otherwise specified, and operates on either alternate or direct current. It supplies temperatures from 70° F. to 400° F.

---

**Who makes calenders? presses? molds? All of the answers are in the 1943 RUBBER RED BOOK. Price: $5.00 per copy.**

# Is your boy out there . . .

# in the land that God forgot?

IS he slogging along some muddy road . . . or huddled beneath a leaky tent? Do you see him now, thirsty beneath a broiling sun?

Or is your boy fighting a wintry blast in the land where winter never ends? . . . Yes, millions of people worry tonight for the men in the lands that God forgot.

But if your heart is sick with longing for some special boy . . . remember this and find comfort . . . wherever he may be, in the frozen wastes of Iceland or the jungles of New Guinea . . . you can reach out and give your boy some little comforts that speak of home.

He will get coffee, doughnuts and other American comforts when the long march is over . . . thanks to you.

He will sleep between sheets when he gets his furlough, in a town ten thousand miles from home . . . thanks to you. Even should he be a prisoner of war, he won't be condemned to live on alien bread. For every week the Red Cross will carry to him a carton of food. Yes, eleven full pounds of real American food, the kind you used to give him at your own table. And real American cigarettes and tobacco!

He will get all this . . . and more . . . straight from *your* heart through the Red Cross.

Because the Red Cross is *you*—the Greatest Mother in the World, because it represents all the mothers of America. The Red Cross is your blood and your bandages, the sweaters you knit and the gifts you pack.

And the Red Cross is your money too! This year when your Red Cross has a bigger job than ever before to do . . . this year when your Red Cross is serving your own sons in every corner of the globe . . . this year you will want to give more, more of your time, more of your work, the blood from your heart . . . and more of your money to help the work go on.

GIVE TO THE RED CROSS

So dig deep and be glad. For wherever he is

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# REVIEWS

## BOOKS

**Annual Report on the Progress of Rubber Technology: 1942.** Edited by T. J. Drakeley. Published by the Institution of the Rubber Industry, 12 Whitehall, London, S.W. 1, England. 7½ x 9¾ in. 131 pp. Price to members, 2/6 (approximately 60c); To non-members, 10/6 (approximately $2.50).

Once again the Institution of the Rubber Industry has succeeded in compiling an annual report, despite all the difficulties concerned these days in such compilation. Although the current report covers the year of 1942 and has been considerably delayed in its publication, the data nevertheless is of extreme value to chemists and technologists.

The current report follows previous editions in its scope, which embraces all branches of the rubber industry. The compilation of specific reports is entrusted to authorities in the specific fields, and the extensive bibliographical references at the end of each chapter are indicative of how well the jobs were done. The subjects reviewed for the year of 1942 and their reviewers follow:

Historical and Statistical Review (T. R. Dawson); Planting and Production of Raw Rubber and Latex, Gutta-Percha, Balata, Chicle and Jelutong (T. R. Dawson); Properties, Applications and Utilization of Latex (C. F. Flint); Chemistry and Physics of Raw Rubber and Rubber Derivatives, Gutta-Percha, Chicle, Balata and Jelutong (W. J. S. Naunton); Synthetic Rubber (B. J. Habgood); Testing Equipment and Specifications other than for Latex (W. J. S. Naunton); Compounding Ingredients, Accelerators, Antioxidants and Softeners (F. H. Cotton); Fibres and Textiles (W. Knight); Chemical and Physical Properties of Vulcanized Rubber (A. E. T. Neale); Tires (G. A. Shires); Belting (G. F. Payne); Hose and Rubber Tubing (J. Kirkwood).

Cables and Electrical Insulation (H. A. Daynes); Footwear (R. C. Davies); Mechanical Rubber Goods (C. H. Birkitt and R. W. Parris); Rubber Flooring (J. Kirkwood); Surgical Goods (C. R. Pinnell); Textile-Rubber Composites, Solvents and Cements (W. N. Lister); Sponge Rubber (W. D. Guppy); Hard Rubber (B. L. Davies); Works Processes and Materials, Including the Treatment of Raw Rubber in the Factory and the Treatment of Vulcanized Rubber (F. H. Cotton); Machinery and Appliances (E. Morris).

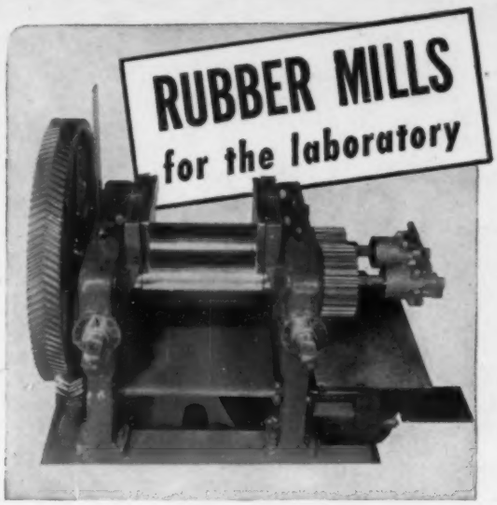
The author and subject indexes are as carefully compiled and cross-referenced as in previous editions.

•

**The Story of the Rubber Life Raft.** By Edgar G. Wandless. Privately printed by the New York Rubber Corporation, 9 Rockefeller Plaza, New York 20, N. Y. 5 x 7 in. 48 pp.

Here is a story that needed writing—the history and development of the rubber life raft which is saving so many valuable lives in the current global conflict. The story is told in detail from the pioneering days—which go back only to the 1910's—up to and including the modern devices which are provided with miscellaneous equipment not only to keep the occupant afloat, but fairly well-fed and healthy.

The book, attractively printed and containing several interesting illustrations, is divided into six chapters, as follows: (1) Introduction; (2) The Pioneering Days; (3) Men and Rafts Against the Sea; (4) The Raft; (5) The Equipment of the Raft; (6) When the Raft Comes Home from the War. The role played by the New York Rubber Corporation in supplying these vital craft for the war effort is threaded into the story itself.

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Weathering effects of sunlight, rain, heavy dew and thermal shock reproduced in the laboratory at an accelerated rate that reduces years of actual weathering to a few days of testing in the —

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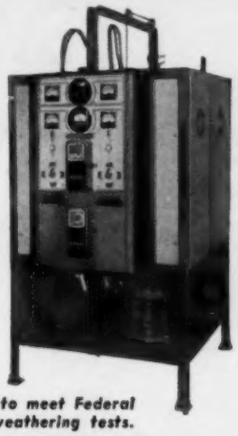

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Phillipsburg, New Jersey



**Standards on Electrical Insulating Materials (with Related Information).** Prepared by Committee D-9. Published by the American Society for Testing Materials, 260 So. Broad St., Philadelphia 2, Penna. 6 x 9 in. 515 pp. $2.75.

This publication gives in their latest form the more than seventy-five A.S.T.M. standards, specifications and test methods covering electrical insulating materials and related products. In addition to the fifty-six specifications developed by the Society's Committee D-9, there are eighteen other standards included to make the book complete pertaining to certain plastics, rubber, textiles, and paper products, etc.

New material included for the first time gives requirements for phenolic molding compounds; laminated thermosetting materials; vulcanized fibre sheets, rods, and tubes; measuring dimensions of rigid rods; natural block mica and mica films suitable for use in fixed mica-dielectric capacitors; orange shellac and other lacs; low and medium-voltage pin-type lime glass insulators; and tensile properties of plastics. Most of these items were developed and published for the first time in 1943.

There are eight standards covering various types of insulating varnishes, paints, lacquers, and their products. Sixty-five pages are devoted to the fifteen methods and specifications for molded insulating materials. A section on plates, sheets, tubes and rods includes thirteen widely used standards. There are three standards on mineral oils and five relating to ceramic products (glass, porcelain, steatite). The seven standards covering various electrical tests comprise seventy pages. There are sections covering insulating paper, mica and rubber products, textile materials, conditioning, enclosures, and servicing units.

An interesting part of the publication is the section giving references on significance of tests of various electrical insulating materials.

## BOOKLETS, CATALOGS, Etc.

**The Elasticity of a Network of Long-Chain Molecules—II.** (Publication No. 39). By L. R. G. Treloar. British Rubber Producers' Research Association, 19 Fenchurch St., London, E. C. 3, England. 6 x 9½ in. 6 pp.

On the basis of the kinetic theory of elasticity, Wall has developed a statistical method for treating the problem of the elasticity of a three-dimensional network of long-chain molecules (*J. Chem. Physics*, Vol. 10, p. 485, 1942), and has applied it to the derivation of the stress-strain relations for the simplest types of deformation of rubber-like materials, namely, elongation, unidirectional compression and shear. The significance of this theoretical approach has been discussed in some detail previously (*Trans. Faraday Soc.*, Vol. 39, p. 36, 1943), in which reasons were given for preferring Wall's method to the earlier attempts to solve this problem. In the current work, the method of Wall is extended to the most general type of homogeneous deformation of rubber-like materials, of which those already considered by Wall are special cases. An expression is derived for the work of deformation, or strain-energy in the general case, and from this certain relations between the principal stresses and strains are obtained. The current publication represents a reprint of original material appearing in the *Transactions of the Faraday Society* (September-October, 1943).

•

**Wage Incentives in Wartime.** Consolidated Management Consultants, 521 Fifth Ave., New York 17, N. Y. 6 x 9¼ in. 48 pp.

Covering all aspects of the wage incentive problem, this booklet may be considered a manual for the application of this government-approved output booster. Choosing a plan to fit specific cases, how to get the approval of the War Labor Board, how to install the plan, and how to keep the plan in scientific operation are subjects treated with in the manual.

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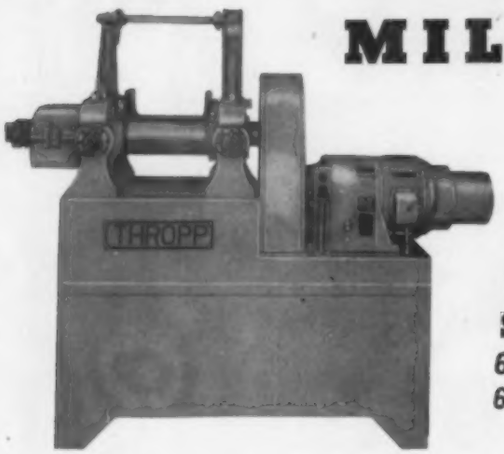


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| Height .....9" | Length .....9¾" | Range .....½" |
| Depth of Throat ....6½" | Dial 50 Divisions Each Div. 1/1000" | Weight .... 4 lbs. Frame . Aluminum |

Designed for gauging stock as it is coming from the calender.

**FRANK E. RANDALL, Waltham, Mass.**


## REVIEWS (CONT'D)

**Adjust-O-Feeders—Chemical Feeding and Proportioning Pumps.** (Bulletin 1100). %Proportioneers, Inc.%, Providence 1, R. I. 8½ x 11 in. 16 pp.

Specific applications of %Proportioneers% equipment in many fields are contained in this new bulletin. Adjust-O-Feeder pumps, of the diaphragm and plunger type, are fully described and complete details of their dimensions and capacities are included. An unusual feature of the bulletin is a large "capacity schedule" which shows at a glance the maximum operating capacity in gallons per hour and discharge pressure in pounds per square inch gauge of all of the company's pumps. The exact pump for any requirement can be easily selected and specified by means of this chart. Diagrams showing approximate plan and elevation dimensions for all types of Adjust-O-Feeders are shown beneath the schedule.

•

**GR-S Field Wire: Factory Trials.** (Booklet No. 1A). R. T. Vanderbilt Co., 230 Park Avenue, New York, N. Y. 8½ x 11¼ in. 8 pp.

Last November Vanderbilt issued a pamphlet on "GR-S in Field Telephone Wire Insulation" containing two formulas together with suggested procedure for mixing and extruding. Since that time a number of manufacturers of field telephone wire have made special runs on 50-pound batches of either or both compounds for factory trials. The present bulletin covers a survey of runs in each of six plants. Some need for modification was found necessary as the work progressed, and these changes are shown in the new report. Data on the compounds, insulating procedure and physical and electrical properties of each, are included.

•

**Blends of Standard Channel and Semi-Reinforcing Furnace Blacks to Match Easy Processing Channel Black.** (Report SRF No. 1). Continental Carbon Co., 311 Peoples Bank Bldg., Akron, Ohio. 9 x 11½ in. 17 pp.

The properties of Continental AA, a typical easy processing channel black, with blends of Continental A, a medium processing black, and various proportions of Continex SRF, a semi-reinforcing furnace black, are compared in this technical report. The laboratory results contained in the report indicate that both in GR-S and natural rubber a blend of about 10% Continex SRF and 90% Continental A matches the easy processing, low heat development properties of Continental AA, while maintaining equal or superior tensile and tear.

•

**Aero AC 165.** American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York 20, N. Y. 8½ x 11 in. 24 pp.

Ratios and combinations in which Aero AC 165 may be used in the compounding of GR-S products are contained in this technical bulletin. Aero AC 165 is a special accelerator for GR-S which combines in one material a special blend of a delayed action activator and mercaptobenzothiazole. Comparisons are made with mercaptobenzothiazole, Santocure, and other accelerators. Test results are given in each instance. The use of the new accelerator with Naftolen and with Monex is also covered.

•

**Blaw-Knox Pilot Plants for Chemical Process Development.** (Catalog 1957). Blaw-Knox Co., Farmers Bank Building, Pittsburgh, Penna. 8½ x 11 in. 24 pp.

The six major steps involved in chemical plant evolution —laboratory research, product evaluation, preliminary process studies, preliminary engineering studies, pilot plant studies, and commercial plant—are outlined and discussed in this new catalog. The engineering services offered by Blaw-Knox in connection with each of these major steps are traced. The catalog also contains a brief discourse on modern methods of chemical technology.

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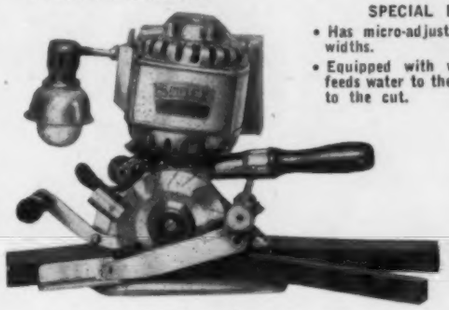

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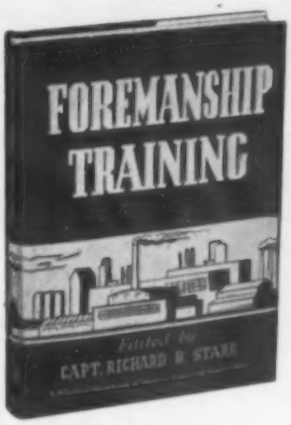


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## REVIEWS (CONT'D)

**B-J-F—Accelerator for GR-S.** (Report No. 441-1). Naugatuck Chemical Division of U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y. 7 x 9½ in. 8 pp.

The general properties of B-J-F, an accelerator developed for use with GR-S, are contained in this report, along with typical GR-S formulas for tread and carcass stocks. Physical test data on these compounds is given. Two typical GR-S camelback formulae containing the special accelerator are also included, along with physical test data. Special processing suggestions to follow when using B-J-F are incorporated in the report. In addition to tire tread and carcass compounds and camelback, B-J-F is recommended for tire repair stocks, molded products, and soles and heels.

•

**Geon Resins and Plastics.** Chemical Division, B. F. Goodrich Co., Akron, Ohio. 8½ x 11 in. 4 pp.

Description of the new group of polyvinyl resins and plastics recently developed and offered for distribution by Goodrich is contained in this four-page folder. One page is devoted to an outline of the characteristics of the four Geon resins currently available, two of which are special polymers of vinyl chloride marked for their thermal and light stability, toughness and general inertness. Geon plastics is the subject of another page, with the range of characteristics described. Still another page is devoted to a partial list of the applications of the new materials, including their use for coated fabrics and papers.

•

**Aluminum Imagineering Notebook.** Aluminum Company of America, Pittsburgh 19, Penna. 8½ x 11 in. 24 pp.

"Imagineering," a word coined by the Aluminum Company of America, is defined as "the art of letting your imagination soar and then engineering it down to earth." As a stimulator of this mental process, this book presents twelve important economic advantages of aluminum and illustrates numerous examples of things which have already been imagineered into aluminum actualities. Subjects covered include light weight, high resistance to corrosion, high conductivity for heat, workability, strength in alloys, and appearance. Several of the subjects covered are of special importance to the rubber industry.

•

**Chemicals by Glyco.** Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y. 8¼ x 10¾ in. 144 pp.

Considerable additions have been made in this latest catalog of chemicals offered by the company. These include a number of plasticizers for synthetic rubber and synthetic resins, as well as further information on the esters manufactured by the company. The usual features of the catalog have been retained, including formulae, suggestions and tables of useful chemical and physical data. Properties of all chemicals offered are clearly furnished.

•

To help both trained men and those of lesser experience to get the utmost service of ball bearings, the New Departure Division of General Motors Corp., Bristol, Conn., has issued a booklet under the title of *Service Procedure for Ball Bearings.*

•

Complete information concerning the mechanical parts and construction of *Rex Speed Prime Pumps,* as well as how the pump operates and what it will do, has been made available by the Chain Belt Co., Milwaukee, Wisc. Ask for Bulletin No. 433.

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*Micromax recorders* designed to measure the pH of a plant process continuously are described in a recent catalog (No. N-96-1) issued by the Leeds & Northrup Co., Philadelphia 44, Penna.

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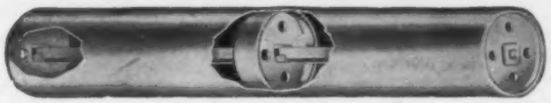

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# MARKETS

***Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings***

**NEW YORK, Mar. 14, 1944**

## Crude Rubber

AS PREDICTED in these columns last month, negotiations have been opened between the Rubber Development Corporation, charged with rubber procurement activities, and the governments of Peru, Colombia and Ecuador in connection with the possibility of signing supplementary agreements, or "treaties" as they are called in official circles, similar to that recently signed with Brazil. The two major points of the Brazilian agreement were: (1) The United States agreed to pay a premium of 33⅓% over the previously agreed price of 45 cents per pound for wild rubber; and (2) Brazil agreed to take on some of the commitments of the Rubber Development Corp.

Although there is little doubt that the negotiations now under way with the three Latin American republics named above will soon result in new trade pacts, the payment of the premium hinges on whether increased costs of collecting rubber in those countries warrants such payment and whether the premium, if given, will result in increased supplies of rubber. Because of the still urgent need for crude rubber to blend with the synthetics, the angle of increased shipments is of paramount importance.

Shipments of wild rubber from Latin America, and particularly from the Amazon area, have been exceptionally disappointing to date, despite the many and varied efforts of those in this country charged with procurement. There are many who maintain that no matter what premium is offered and which government handles collection activities, little additional supplies will be forthcoming. The answer, of course, lies in the future.

Prices shown below are those set by the Rubber Reserve Company:

| | C | N-C |
|---|---|---|
| ***Plantations—*** | | |
| Ribbed Smoked Sheets, 1X | 22½ | 40 |
| Thick Pale Latex Crepe, 1X | 22½ | 40 |
| Thin Pale Latex Crepe, 1X | 22½ | 40 |
| Thick Brown Crepe, 1X | 21⅜ | 38⅞ |
| Thin Brown Crepe, 1X | 21⅜ | 38⅞ |
| Thick Remilled Blankets, #1 | 21⅜ | 38⅞ |
| Rolled Brown or Flat Bark | 18 | 35½ |
| Smoked Blankets, #1 | 21⅛ | 38⅛ |
| Claro Brand 1XRSS | 22½ | 40 |
| Sole Crepe Trimmings | 22 | 39½ |
| Sole Crepe | 22½ | 40 |
| ***Wild—*** | | |
| Uncut Fines, Crude | 15 | 29 |
| Cut Fines, Crude | 15½ | 29¾ |
| Cut Fines, Washed & Dried | 22½ | 40 |
| Upriver Coarse, Crude | 12⅜ | 26⅛ |
| Upriver Coarse, Washed & Dried | 20¼ | 37¾ |
| Caucho Ball, Crude | 11⅜ | 24¾ |
| Caucho Ball, Washed & Dried | 19½ | 37 |
| ***Guayule—*** | | |
| Carload Lots | 17⅛ | 31 |
| Less than Carload Lots | 18 | 31½ |
| ***Balata—*** | | |
| Surinam Sheet | 42½ | 42½ |
| Manaos Block | 38¾ | 38¾ |
| Colombian Block | 38¾ | 38¾ |
| Peruvian Prime | 38¾ | 38¾ |
| Chicken Wire | 23¾ | 23¾ |
| ***Latex—*** | | |
| Normal, Tank Car Lots | 26 | 43½ |
| Creamed, Tank Car Lots | 26¾ | 44⅛ |
| Centrifuged, Tank Car Lots | 27¾ | 45¾ |
| Heat-Concentrated, Carload Drums | 29½ | 47 |

C. for Civilian Use; N-C. for Non-Civilian Use.

## Scrap Rubber

Scrap rubber supplies continue plentiful due to the stockpiles amassed during the nation-wide scrap rubber collection campaign last year, but dealers report a noticeable falling off in recent collections. This is a situation that was bound to occur with the limitations imposed on civilian rubber goods. Dealers, however, are confident that they can keep the reclaimers supplied for the next two or three years without facing any major difficulties. The scrap rubber activities of the Rubber Development Corporation, heretofore centered at Washington, have been shifted to the office of the Distributing Agent in New York City. Prices shown below are ceilings on typical grades of scrap:

(Prices to Consumers, Delivered Akron)

| | | |
|---|---|---|
| Mixed passenger tires | ton | $20.00 |
| Beadless truck tires | ton | 26.00 |
| Mixed truck tires | ton | 20.00 |
| Beadless passenger tires | ton | 26.00 |
| No. 1 passenger peelings | ton | 52.25 |
| No. 1 truck peelings | ton | 52.25 |
| No. 2 passenger tubes | lb. | .07¾ |
| Red passenger tubes | lb. | .07½ |
| Black passenger tubes | lb. | .06¾ |
| Mixed passenger tubes | lb. | .06½ |
| No. 2 truck tubes | lb. | .07½ |
| Red truck tubes | lb. | .07¼ |
| Black truck tubes | lb. | .06½ |
| Buffings | ton | 35.00 |
| Bicycle tires | ton | 15.00 |
| Air bags and water bags | ton | 15.00 |
| Boots and shoes | ton | 33.00 |

## Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

| | | | | |
|---|---|---|---|---|
| Peeler, carded, 23/5/3 | lb. | .43½ | @ | .44 |
| Peeler, carded, 23/4/3 | lb. | .44½ | @ | .45 |
| Peeler, carded, 15/3/3 | lb. | .41½ | @ | .42 |
| Peeler, carded, 15/4/2 | lb. | .41½ | @ | .42 |
| Peeler, carded, 13/3/3 | lb. | .40½ | @ | .41 |
| CHAFERS | | | | |
| Carded, American, 1 1/16" | lb. | .43½ | @ | .44 |
| Carded, American, 1" | lb. | .39½ | @ | .48 |

## Sheetings

| | | | | | | |
|---|---|---|---|---|---|---|
| 48x40 | 36 in. | 5.50 | lb. | — | @ | 7.818 |
| 40x40 | 36 in. | 6.15 | lb. | — | @ | 6.991 |
| 40x36 | 36 in. | 6.50 | lb. | — | @ | 6.615 |
| 48x48 | 40 in. | 2.50 | lb. | — | @ | 16.200 |
| 48x48 | 40 in. | 2.85 | lb. | — | @ | 14.210 |
| 56x60 | 40 in. | 3.60 | lb. | — | @ | 11.944 |
| 48x44 | 40 in. | 3.75 | lb. | — | @ | 11.066 |

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

## Cotton

The price of middling uplands on the Cotton Exchange has moved in a 58 point range since our last report, high for the period being 21.77 on March 13 and low 21.19 on March 3. The average price for middling uplands in the month of February was 21.34, based on 23 trading days. The price moved up steadily from mid-February until the end of the month, reaching 21.54 on February 25, but on the last day of the month—February 29—it broke sharply, dropping from 21.40 on February 28 to 21.20. The sharp 20-point drop was attributed to heavy selling occasioned by favorable war developments and the growing belief that the war in Europe will end this year. Renewed trade buying drove the price up again until it reached the high point of 21.77 on March 13. According to an independent survey, cotton growers in the United States plan to put only 21,933,000 acres in cotton this year, the smallest acreage since 1895. Quotations for middling uplands on the Exchange (old contract) follow:

| | Feb. 11 | March 14 | | |
|---|---|---|---|---|
| | Close | High | Low | Close |
| March | 20.55 | 21.34 | 21.15 | 21.17 |
| May | 20.17 | 20.86 | 20.67 | 20.70 |
| July | 19.74 | 20.26 | 20.10 | 20.13 |

## Reclaimed Rubber

The demand for reclaimed rubber continues unabated, with no indications of easing up for the next several months, despite the growing availability of the general purpose synthetics. Although the demand is fairly well spread among all branches of the industry, heavy calls continue particularly from the manufacturers of camelback. The recently renewed interest of heel and sole manufacturers, reported last month, also continues. Prices shown below are ceilings on typical grades of reclaimed rubber:

| | | | | |
|---|---|---|---|---|
| ***Shoe*** | | | | |
| Unwashed | lb. | .07 | @ | .07¼ |
| ***Tube*** | | | | |
| Black Tube | lb. | .11¼ | @ | .11½ |
| Red Tube | lb. | .12 | @ | .12¼ |
| ***Tires*** | | | | |
| Black (acid process) | lb. | .07½ | @ | .07¾ |
| Black, selected tires | lb. | .06½ | @ | .06¾ |
| Truck, Heavy Gravity | lb. | .08½ | @ | .08¾ |
| ***Miscellaneous*** | | | | |
| Mechanical blends | lb. | .04½ | @ | .05½ |
| White | lb. | .13 | @ | .13¼ |

## Ducks

| | | | | |
|---|---|---|---|---|
| Enameling (single filling) | lb. | — | @ | .44¼ |
| Belting and Hose | lb. | — | @ | .39 |
| Single filling, A grade | lb. | — | @ | .19¾ |
| Double filling, A grade | lb. | — | @ | .20¾ |

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RUBBER CHEMICALS
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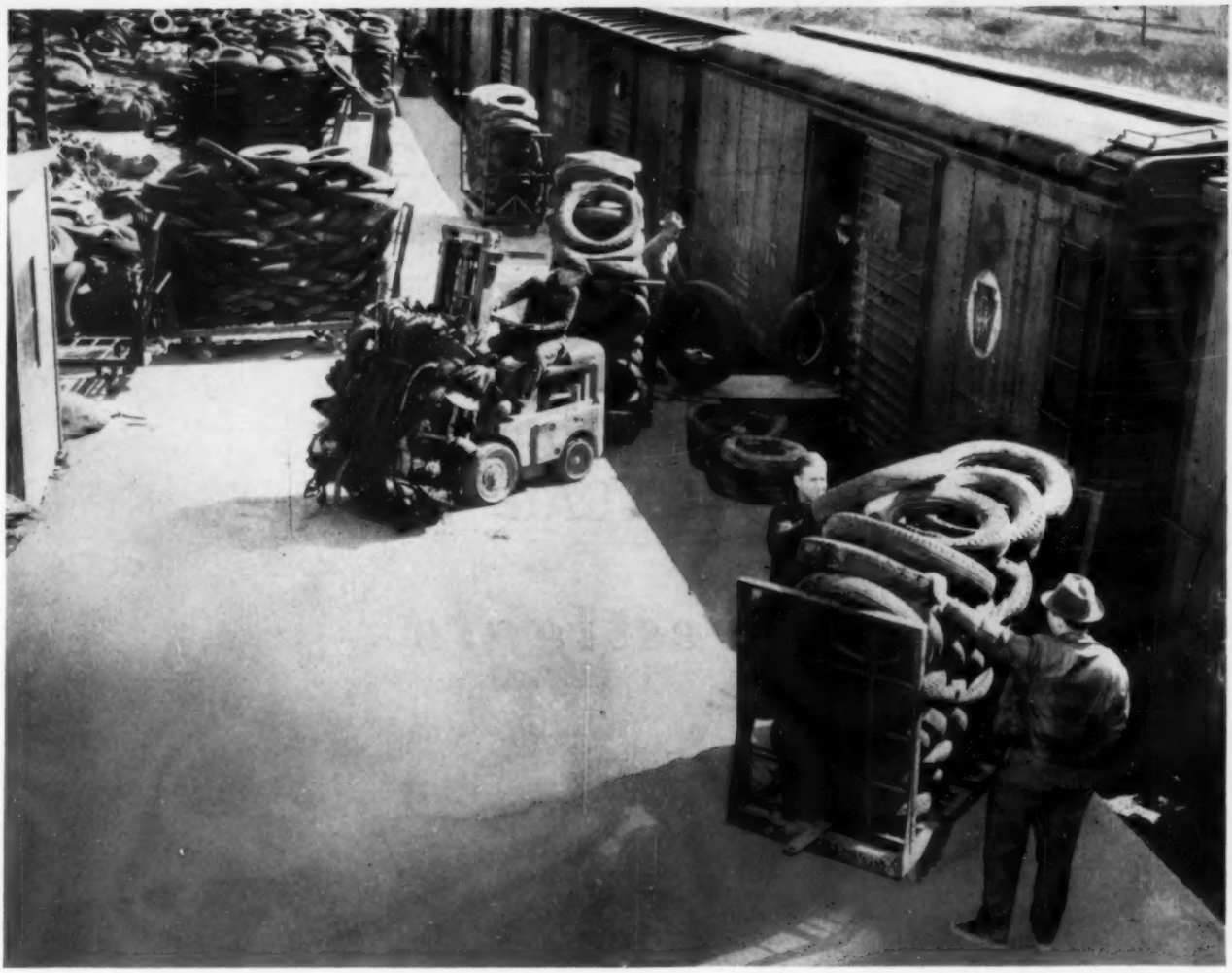

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